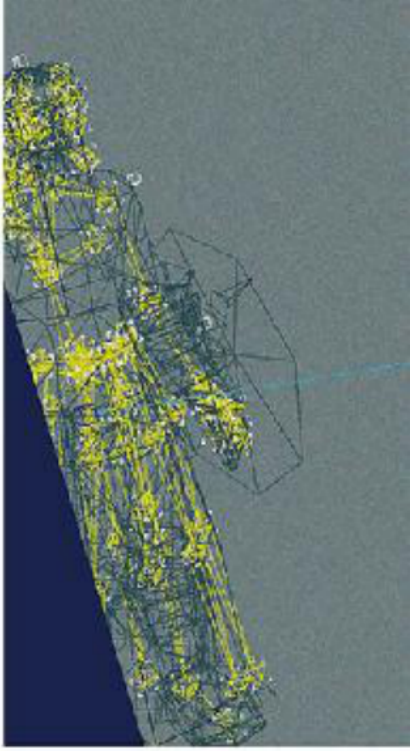
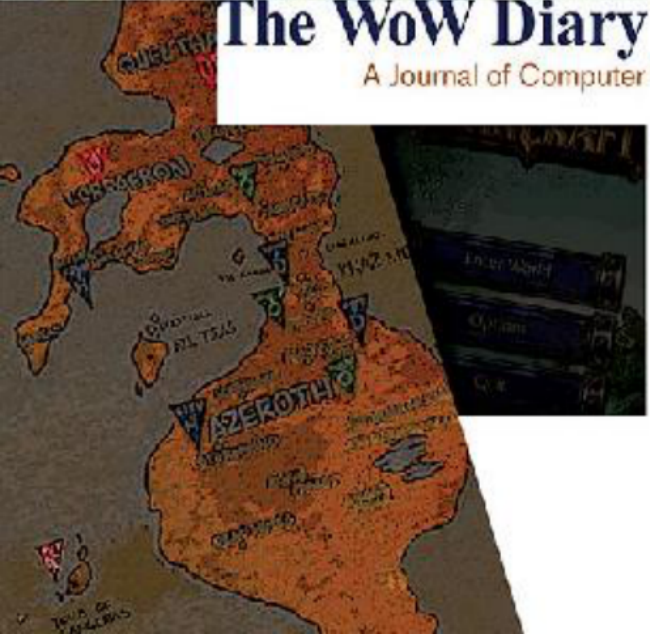


The WoW Diary

A Journal of Computer Game Development

John Staats



About the Author

John Staats was born and raised in Akron, Ohio. He earned a BFA from Kent State University's Visual Communication Design program and spent ten years in advertising in NYC. Before joining Blizzard he had decades of amateur level design experience, from tabletop games to first-person shooters. His homepage, whenitsready.com, marks the progress of his various projects, including an upcoming board game based on dungeon crawls.

John built 90 percent of Vanilla WoW's non-instanced caves, crypts, dens, mines, and hive tunnels. His Vanilla WoW portfolio includes:

Ahn'Qiraj Temple
Blackfathom Deeps
Blackwing Lair
Blackrock Mountain
Blackrock Depths
Booty Bay
Karazhan (w/Aaron Keller)
Loch Modan Dam
Lower Blackrock Spire
Molten Core
Razorfen Downs
Razorfen Kraul
Scholomance
The Slag Pit
Upper Blackrock Spire
The Wailing Caverns
Warsong Gulch (w/Matt Milizia)

The WoW Diary

A Journal of Computer Game Development

John Staats

whenitsready

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For Team 2, both old and new

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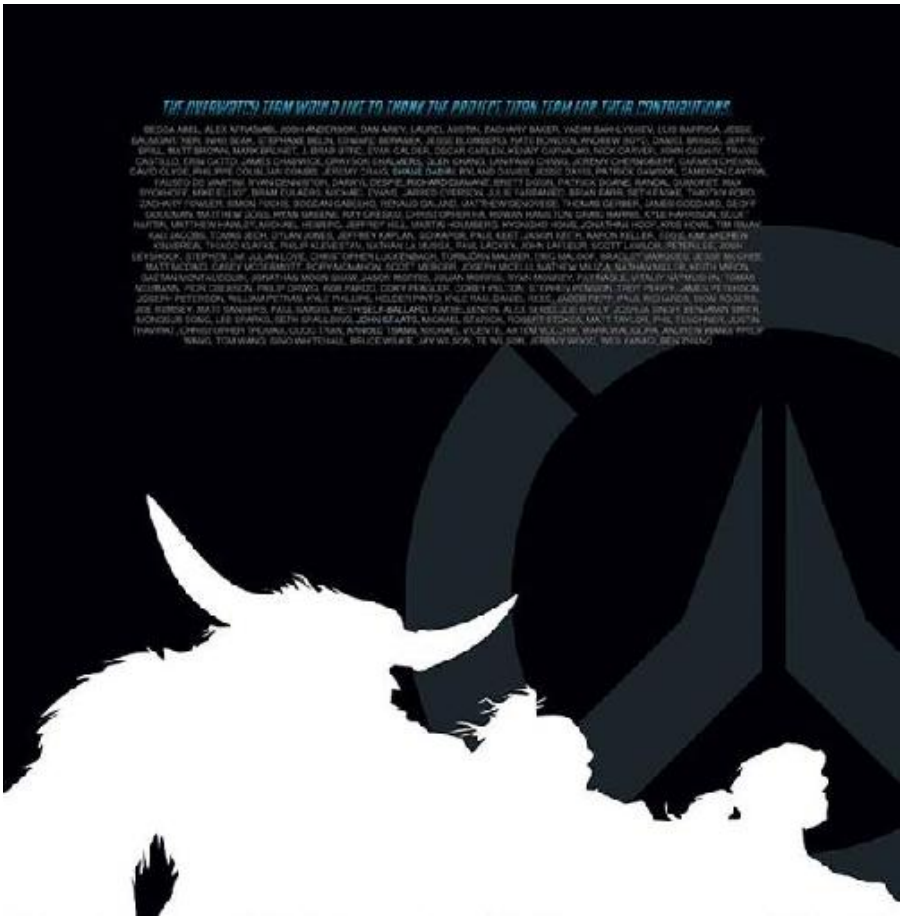
"I imagined the space shuttle blueprints were going to be the largest project I'd ever work on. I was wrong. Our game's editor has more lines of code."

— David Ray, World of Warcraft database/tools programmer

At its November 2004 launch, *World of Warcraft* (WoW) was the biggest game ever made, pushing past two million lines of code, roughly four times the size of most top-tier computer games. Its development team and budget were larger than any of Blizzard Entertainment's previous projects. Its subscriber base grew to the size of the world's biggest cities and generated a virtual goods economy comparable to the GDP of small nations. The company grew from hundreds to thousands of employees,

the bulk of whom were customer service representatives who became Blizzard's single costliest expenditure. At launch, the interface, quests, and game elements used over a million words that translated into six languages. There were almost nine thousand types of monsters or non-player characters (NPCs) in the game. The most varied creature was the ogre (170 versions), followed by the murlock (100 versions). Until YouTube began streaming videos a year later, WoW servers handled over 10 percent of global Internet bandwidth in downloads, and its players contributed to roughly half of active global Internet traffic at any given time. The sun never sets on the Warcraft empire.



“Titan” was a canceled project whose assets were used for Overwatch. Although nothing I created was used by *Overwatch*, it was nice to be included in the acknowledgments. Blizzard’s classy move of thanking everyone who contributed to the doomed “Project Titan” emboldened me to finish the story about making *World of Warcraft* so people might appreciate how hard it is to make computer games. Images provided courtesy of Blizzard Entertainment, Inc.

May 2016: Preface

I am writing this in late May 2016, days after Blizzard's newest title, *Overwatch*, has launched. My former team leader and ex-roommate Shane Dabiri shared a Facebook post celebrating Blizzard's latest title, which prompted me to recall the time when Shane and I saw each other every day while we worked on *World of Warcraft*. Although we drifted apart after WoW shipped in November 2004, whenever we saw each other he often asked, "What ever happened to that *World of Warcraft* diary you were working on? Everyone wants to read it!" I sometimes got this question when I reconnected with anyone from the old crew. Everyone on the team knew I was writing a "developer diary," since I'd spent four years interviewing people about their jobs and keeping tabs on the game's incremental progress. Seeing Shane's Facebook post about *Overwatch* inspired me to polish and publish this four-year time capsule about making the game now referred to as Vanilla WoW.

I have only a diminished view of WoW these days. Is "Vanilla" the correct term? Or is it "Classic"? I have no idea. I neither make nor play computer games anymore. I only recently learned Blizzard was shipping an expansion called *Legion* during a conversation with friends while playing a tabletop role-playing game called *Pathfinder*. In terms of computer games, I am, as I once was, out of the loop.

The reason I wrote this diary has its roots in my life before game development. I didn't come from a place where computer games were made, nor did I know anyone in the software or entertainment industry. I was born and raised in Akron, Ohio, and spent ten years working in Manhattan ad agencies after graduating college. Until I began editing games myself in the mid-1990s, I'd never known anyone in the electronic entertainment industry, and so the process of developing computer games remained an impenetrable mystery. After the Internet gave everyone access to everything, gaming fans began connecting with developers. My introduction to this community was playing first-person shooter (FPS) online games, whose most popular titles—*Quake* and *Unreal*—catered to hobbyists who modified their games into new versions, called "mods." When I learned there were mod tools that would allow me to build my own 3D levels, I bought my first PC the very next day (I had played games on my roommate's machines until that point) and built my own first-person shooter levels over the next five years. I soon joined a group of fellow artists and programmers, a mod team, called Loki's Minions Capture the Flag, and began learning the basics. I worked tirelessly at my new hobby, putting in over-one-hundred-hour weeks on mods when I was between advertising campaigns.

First-person shooters were in their heyday in the mid to late nineties for

the simple reason that they supported the only worldwide 3D gaming community, and many FPS game developers (known as "devs") worked in a spotlight. Devs published daily updates about their development progress, which gave fans like me the first inkling into what kind of effort went into making games. Many pros became subculture celebrities, and magazines wrote stories about these "Game Gods." Some became popular because they were the best in the business, while others were prolific writers or had outlandish personalities. I, too, found Game Gods entertaining and dreamed of becoming one in my own right someday. After five years of modding, I'd inadvertently developed a respectable portfolio of original 3D levels, and when someone from my mod team told me Blizzard was hiring level designers, I applied in the summer of 2000.

At the time, I was in New York City, working at a Madison Avenue ad agency, and my only exposure to game development was through the guys in my mod group. We communicated only in emails, instant messages, and the occasional LAN party (where people met their Internet pals at hotels and played networked computer games all weekend). We were a bunch of hobbyists tweaking games for fun without any promise of a career in the industry. I was successful at my day job in the corporate world, but since I had spent every free waking hour building *Quake* levels, the idea of going pro wasn't so crazy. Although I was comfortable as an advertising department director, I wasn't artistically satisfied, so I jumped at the opportunity to work at Blizzard and submitted my latest 3D levels. They proved to be good enough to earn me a phone interview.

I wasn't nervous during my first conversation with Blizzard because we were talking about level design, so I was well inside my comfort zone. My ebullient enthusiasm convinced them I was worth a closer look, so they flew me to Orange County, California, for a face-to-face meeting. OC was certainly different from NYC, and I'd joked that it felt like the frontier. I remember staring at the bizarre tropical trees growing outside my hotel window, wondering if I'd ever fit into this alien world of endless summer, valet parking, and underground lawn sprinklers.

To say that Blizzard was laid-back was an understatement. Their building was in the middle of a sprawling corporate park surrounded by scores of identical cookie-cutter office prefabs that were typical in Irvine, a planned city where trees grew in straight rows. The lobby was tiny and quaintly decorated with faded posters of old Blizzard games. Guests waiting for appointments could flip through binders filled with fan art drawn by children who had mailed it to Blizzard in lieu of hanging it on their refrigerators. Those charming binders of pictures were more seductive than any extravagant lobby I'd seen in NYC. This place seemed special already.

It made me recall the summer I worked for my aunt and uncle who ran an industrial sales company back in Akron. My uncle was the closest thing to a white-collar worker in my family, and since I was the first generation to get a

college degree, any business advice he gave made a strong impression. I remember how he once disparaged successful companies who squandered money on expensive conference tables or designer furniture. Although I recognized my uncle's ideology in Blizzard's modest office decor, I'd be remiss to omit my initial reaction to Blizzard's development area. The Team 2 area was a dump, decorated like someone's basement. With a glance down the hallway, I could see that half of the fluorescent lights in the ceiling were burned out. The closest thing to a kitchen was a tiny microwave next to a sink filled with dirty dishes. Food stains, blackened with age, had been ground into the carpet. The halls were littered with spent halogen floor lamps and torn cardboard boxes filled with discarded toys and books. The conference tables were cluttered with soda bottles and stacks of unused condiments, and these tables were orbited by a graveyard of broken and unmatched office chairs. A set of black leather couches faced at haphazard angles with no purposeful direction. The walls were covered with dog-eared posters, and every desk and shelf was laden with dusty statues and action figures. People walked around wearing shorts and flip-flops. All evidence indicated this was *not* an ego-driven environment, and it struck me as a very comfortable place—a person could just plop down and get to work. These offices were so dissimilar to Madison Avenue that I wondered how I would fit in. I didn't even own jeans or sneakers; all my clothes were work related (slacks, dress shoes). Was it possible that this casual atmosphere shared the same work ethic as the career-driven culture I knew from in Manhattan?

With a welcoming smile, Mark Kern introduced himself as Team 2's co-lead and the company's temporary recruiter. He escorted me past the team's area for an interview with the designers, Eric Dodds and Rob Pardo, who were both friendly and personable. We talked in a conference room furnished with matching chairs and wall-to-wall windows that provided an unobstructed view of the 73 toll road. The interview went well. I rambled on about level design, games, and other geek influences. I learned that the level in my portfolio that everyone especially liked was called The City of Brass, a reference to the Dungeons & Dragons rulebook, *The Dungeon Master's Guide*.

I'd even met a couple of members of the development team, including one of the Game Gods from id Software, John Cash, who was once technology lead for *Quake II*. (I later learned that Mark usually introduced job candidates to John because his presence on their unannounced project gave it more credibility.) One of my 3D levels was filled with graves whose epitaphs included the names of friends and celebrities in the first-person shooter community; John's name was among them. Unfortunately, I'd given him a lackluster plot in the graveyard (all the good plots were assigned to artists and level designers from id and my mod team), and I used the opportunity to apologize for the oversight. John couldn't have been nicer. He and I laughed and chatted about his first-person shooter days, and anyone who knew John

knows how much he loved to tell old war stories from his time at id Software. He was so friendly (everyone was) it really made me want to be a part of this team, even if they couldn't tell me what kind of game they were working on.

A week later I received the first job offer Blizzard had ever made to a level designer outside of the company. The offer was $50,000—which was $30,000 less than what I made in advertising. I accepted in a heartbeat.

I absorbed so much on my first day on the job. One thing I learned was that Blizzard's public relations philosophy was diametrically opposed to that of the first-person shooter community. Nobody publicly took credit for what they did on a game, so *everyone* in the company could share in the ownership. In fact, contact with the public was prohibited. Blizzard went against the grain of an industry that considered every piece of publicity good for the company. The founders only wanted to be known for their finished work, and that mentality trickled down through their corporate culture. This immediately dispelled my Game Gods delusion that the most renowned developers were also the most crucial. My new teammates explained that Bill Roper was the voice of Blizzard, and he was our official press liaison. They even joked that if the fans got the impression Bill single-handedly built all the games, then all the better. This let employees focus on their jobs, and it extinguished the danger of people becoming jealous over one another's acclaim. It made sense. Blizzard embraced this radio silence to such an extreme that rank-and-file developers rarely communicated with the fans and never spoke to the press.

I later discovered that the only problem with this approach was that it made it difficult to hire industry veterans. Blizzard was a black box, so few had a positive impression of its corporate atmosphere—one that embraced geek culture, that was a fun place to work, and where management listened to employees. But since Bill Roper, the corporate PR guy, was the only person who spoke about how awesome it was to work at Blizzard, many outside developers remained skeptical.

This was my long-winded answer to Shane's question as to why I waited so long to polish and publish this diary. I couldn't write a development diary without breaking the company's code of silence. My byline would paint a target on me for journalists, and I didn't want (or deserve) Bill Roper's job of being Blizzard's spokesperson. But avoiding undue credit for my contribution to the project was just one reason why I didn't finish this book sooner.

I had a similar misgiving about how to give credit to my teammates and other supporting people in the company. In the years it took to write this book, I would see some people more frequently than others, so naturally my monthly entries focused on them. But some of the hardest workers weren't as social and kept to themselves, hunched over their keyboards. And though Team 2 was a model of team ownership, I'd made disproportionate mentions

of the decision-makers, which might devalue everyone else's contribution and paint an inaccurate portrait of how the team actually worked. I referred to leads frequently because they often made announcements and represented the team's collective decisions, not because they were the most important devs. Citations in this book were by no means commensurate with individual contributions, and giving accurate accreditations would have bogged down the narrative with names. I didn't want anyone with whom I interacted on a day-to-day basis begrudging me if I misrepresented their role. Releasing this journal now, many years later, hopefully softens any disappointment at not being accurately remembered or portrayed. I apologize if I misunderstood, omitted, or underplayed anyone's contribution to this massive project. My anxiety about omitting people's contributions was so bad that I overcompensated by neglecting to cover my own area of specialty, the interior level design (dungeon) department. I was so worried about being perceived as a self-publicist, I barely wrote about the dungeon team's contribution at all. Aside from the references to the dungeon team—which I recalled from memory—the rest of this memoir is as I wrote it over a decade ago. I changed my prose to past tense and cleaned up the text only for grammatical and narrative purposes.

I was also too nervous to show my scribblings to anyone. This was a development diary, a personal thing, and I'd worried my teammates would give me good-natured ribbings if I goofed up the facts. I enjoyed being the guy whose ear was close to the ground, who knew all the gossip. My officemate Aaron Keller would often get excited about telling me juicy inside info he'd just heard over lunch, and I'd inevitably disappoint him by telling him I'd already known for weeks. "Dang it!" he'd cry while I cracked up. "How did you find *that* out!?"

And what of the post-launch WoW devs? Would it affect them if I published a book that left all of them out? Team 2 staff had reduced to half (thirty-five people) after WoW shipped, and with all the new faces replacing the departed, the team had changed its structure, process, and vibe. I didn't want my new coworkers wondering, "What in the hell is John writing about? It's not like that here at all!"

Waiting to publish this was the right call. My distance from the project, the company, and the industry provides me with the perspective not only to explain this process in layman's terms but also to appreciate the experience as an outsider and not the jaded veteran I'd become. I've developed a more mature perspective. And so too, I suspect, has the reader. Enough people have tried WoW that I can use it as a common frame of reference. A postmortem of a lasting game will be more meaningful than reviewing the latest fad.

It is with this frame of mind that I beseech the reader to regard this journal as the work of only one proverbial blind man feeling a very big elephant. A large group of creative people doesn't work like a hive mind; when I describe the team as having felt one way or another, it is a generalization. I exaggerate

for the sake of clarity. There are, no doubt, former coworkers who will disagree with my account, and I'm fine with that. I am guilty of mistakes, misquotes, and personal interpretation, so don't treat these words as canon.

This brings me to my final explanation for sitting tight on this diary. Like the ouroboros snake eating its own tail, this last reason circles into my original inspiration for writing it in the first place: I wanted this journal to be educational. I originally came to Blizzard with fresh eyes and wanted to record everything I learned for people who, like me, believed in Game Gods or other industry myths. Years later, having learned so much, I want to pass it on.

In my efforts to understand and describe the moving parts of a development team, I asked my teammates questions while we worked on WoW. I took it upon myself to visit everyone's office to see what they were busy with and pick their brains. I was genuinely curious about their roles on the project. I wanted to know about their limitations, bottlenecks, opportunities, and discoveries. I would poke my head into their office and ask, "Hey there. Whatcha working on?" That question was all it took to get the conversation rolling, and the summation of their answers resulted in this book.

I am no longer in the gaming industry, because I developed a neurological problem in my hands that hinders me from using a computer for significant lengths of time. This pain prohibits 3D modeling, which requires constant mouse-and-keyboard interaction. It also prevents me from playing computer games. Even now, I write this using voice-to-text software to rest my achy fingers. As I turn toward what I hope will be a career in writing or academics, I will attempt to demystify game development, pass on what I've learned, and possibly expose this misunderstood industry to a wider pool of potential talent. This diary is a textbook of essays. It isn't a corporate promotional piece or fan fluff to collect; I am not trying to make Blizzard look good. If I am complimentary, it is because I genuinely admire their methods.

In the spirit of education, the first thing I would like to impress upon you is one of the most surprising lessons I learned: Public speculation is always wrong. Always. Blizzard operated under a blanket of scrutiny, and only after I was in the meetings could I appreciate how inaccurate public analysis was. *Unless you're in the room, you have no idea what's going on.* Unless someone knows firsthand the reasons why a company makes decisions, popular conjecture is completely off. For a company as secretive as Blizzard, the tinfoil-hat theorizing about why we did anything was severe, cynical, and reactionary. It struck me how people universally assumed corporate decisions were thoughtless or callous—like if a feature was dropped, it was done so without regard for the feelings of the fan base. When decisions were made for financial grounds, people assumed it was because developers lacked

imagination. Whenever technical or gameplay decisions were made, it was assumed the company was penny-pinching. I'm not even referring to the trolls dredging the game forums for flame wars; I'm talking about the intelligent, well-substantiated, and reasonable arguments about why Blizzard did this or why Blizzard did that. But…all of it was wrong and certainly not because the fan base was stupid. People were wrong because they considered only variables that were public knowledge—which were only a fraction of the pertinent factors.

Game development is incredibly complicated, and fans see only a few pieces of the puzzle. Games are often headless monsters; moved in different directions by technological, design, or financial limitations, instead of by anyone in the studio. Game development is sustained improvisation, and if this book can hold your attention long enough, maybe you'll walk away understanding how many pieces it takes to build a massively multiplayer online game (MMO).

Development is often random and iterative. There are failures and discoveries, and the process zigzags until someone says, "Ship it!" Even some developers wouldn't know what was happening on their own project until they got out of their seat and talked to the devs who had been in the room, in the meeting, and directly asked questions about what was going on. That's basically what I did for four years—I got out of my seat and asked, "Whatcha working on?"

I tried to confine this narrative to layman's terms with minimal technical descriptions and industry jargon. I imagine many gaming veterans might roll their eyes at my simplifications, opinions, or experiences, since much of this journal covers topics already familiar to them, but maybe stepping back for a moment might help them appreciate how fortunate they are to work in a field that affords them even the smallest measure of enjoyment, creativity, or pride. To give outsiders more pieces of the puzzle, I think it's worth covering a few basics.

I'm also hoping that an independent publication (this is not a product of Blizzard Entertainment) has the best chance of painting a credible picture of game development—but in full disclosure, I offered a preview manuscript to Blizzard to ensure I didn't reveal anything that could damage their image or products. They even corrected some mistakes. If you're hoping for a tell-all exposé filled with gossip, proceed no further. I have no desire to embarrass anyone. I wrote about people just doing their job. I want to humanize, educate, and document the unfamiliar process of making a top-tier computer game. My goal is to put you in the room.

Why MMOs Are So Difficult to Create

Before I describe my journey, I must explain the differences between massively multiplayer online games (MMOs) and other kinds of computer games. Even regular games are difficult to make, possibly the riskiest software to develop because it's hard to know if something is fun unless it's experienced—and getting there can take years of work and lots of money. On top of all the demanding requirements necessary to make a computer game, MMOs amass even *more* difficulties.

Because MMOs connect thousands of people together in the same play space, they require extremely efficient network code. MMO servers keep track of movement, targeting, and inventory. If a character moves or faces a different direction, the server must send the movement update to every player in the area. This is compounded by the fact that players might be surrounded by hundreds of other characters. This can cripple network traffic because MMOs are open worlds where player congregation is unrestricted and unpredictable. No other games need to do this. Even the code for simple player positioning must be extremely efficient; otherwise, the server's processors can't handle the workload.

Cheating is a bigger problem for persistent games. MMO exploits can ruin a game's economy by devaluing incentives for everyone, cheaters and non-cheaters alike. If someone discovers a shortcut, the networked masses could quickly learn it and take advantage.

All gameplay features must be built within the severe restraints of a client–server architecture to prevent software hacks. Things like precise hit-detection (a common game mechanic in FPS games) couldn't be processed on heavily populated servers; nor could it be processed on the ever-hackable client.

Not only are MMOs constrained by harsh technological limitations, but features supporting gameplay must be flexible enough to be interesting and fun in the long run. Gameplay must be recursive. For every suggested feature, it must be asked, "Will players want to do that every day? Can this feature be reused differently to branch into other kinds of gameplay?"

There are gameplay issues in creating enough incentives for what is essentially an endless game. MMOs are role-playing games in which players measure progress by the equipment they acquire. Since some items are more powerful than others, a complicated balancing act ensues to prevent the better equipment from bestowing unfair advantages. If gear always lets some players steamroll others, the audience will fracture into the haves and the have-nots, creating an environment that deters casual players from continued play. While equipment cannot be so different that casual players can't compete, high-end rewards must be good enough to justify investing the extra time needed to get them. To further complicate things, rewards of one activity cannot supplant

those of another—so items have to be evenly dispersed to avoid rendering some content obsolete. Establishing a harmony with rewards is also bedeviled by the fact that there are far more activities and zones than there are item slots.

Not only is balancing rewards compounded by persistent gameplay, so too is creating content. A never-ending game must appeal to audiences with very different levels of commitment. MMOs need months of content, not hours. They must accommodate both casual players and those who play over a hundred hours a week, and that requires a large content creation team—which is another reason why MMOs are so expensive to make. Hiring enough highly skilled, specialized employees to meet the content and technological demands is difficult, costly, and time consuming.

Finding realistic investors who can afford to support a product to a polished completion is nearly impossible. As hard as it is to find the right investor, it's harder for them to find a studio that can be trusted with an eight- or nine-figure budget. Incompetent and untrustworthy studio heads are often good salesmen and difficult to distinguish from trustworthy developers. The amount of time and money necessary to build an MMO is so great, a dishonest studio head doesn't even need to care about sales; the investment *itself* attracts scammers.

The combination of these risks creates a gravity well of failure that very few companies escape. Just one miscalculation can spoil a title, which must become a commercial hit in order to support its own weight. Massively multiplayer online games are *that* hard to make; but we did it.

Blizzard's Team 2 was grooving on the new colored lighting, March 2001. Using my retouching skills from my advertising days I Photoshopped our blurry team picture into one of our first zones, Westfall. The head count had almost doubled since I'd joined half a year earlier. Image provided courtesy of Blizzard Entertainment, Inc.

Standing, top left: John Staats, Shane Dabiri, Mark Downey, Justin Thavirat, Matt Sanders (giving a Benny Hill salute), Brandon Idol, Eric Dodds, Allen Dilling, David Ray, Twain Martin, Toph Gorham, Dan Moore, Matt Oursbourne
Kneeling: Josh Kurtz (choking Bo Bell), Kyle Harrison, Collin Murray, Jeff Chow (giving bunny ears), Tim Truesdale, Mark Kern, Kevin Beardslee, Joe Rumsey
Sitting: Bo Bell, Gary Platner, Tom Jung (with bunny ears), John Cash (with bunny ears)
Sitting front: Brenda Perdion, Scott Hartin, Jose Aello, Brian Hsu, Bill Petras, Chris Metzen, Solomon Lee
Lying coquettishly on the ground: Roman Kenney

March 2001:
My First Six Months

"The origin."

— Written in the corner of the men's room, whose white tiles and black grouting formed a 3D grid.

Blizzard celebrated its tenth anniversary on a Saturday evening in March 2001. At the time, there were teams working on *Warcraft III*, a *Diablo II* expansion, and *World of Warcraft*. Team 2, whose project was the latter, was staffing up to conquer the largest project the company had ever undertaken: a massively multiplayer online game. I decided to write this development diary on the night of the anniversary party, after I'd been on the team for half a year. I thought it would be interesting to keep track of our progress simply because I could tell it wasn't always going well—especially with the dungeons, which were a mess. I leaned forward in my ridiculously fancy boardroom chair and began writing.

My chair was conspicuously posh and the envy of the team (or, at least, it should have been), since many of the seating options in Team 2 were cheap, uncomfortable hand-me-downs. Whenever someone's office chair broke, they swapped it with another. Since the hallway conference table was at the bottom of this pecking order, it made for both a precarious place to sit and slim pickings for the new hires. Whenever the producers ordered more chairs for the conference tables or future employees, people quickly filched them for their own offices. While the conference table chairs were always fair game, occasionally poachers would swap chairs with those who were on vacation! To avoid playing musical chairs, I purchased a beige leather throne, an executive boardroom model that stood out from the black and plastic standard-issue seats everyone else used. I found it at a used office furniture store, reasoning that the $200 investment would pay off over the years of late nights ahead.

I was midway through building a tower called Karazhan, using an editor called Radiant, software that many of the FPS games used to build their 3D levels. Radiant was developed by id Software, the company that pioneered 3D games and where John Cash, our technology lead, hailed from, and he'd

secured id's blessing to evaluate their editor to see if it was the right tool for our project. I'd worked with Radiant (or similar editors) for over five years, but after six months of applying it to an MMO, I was beginning to think we were headed in the wrong direction.

In the months that I'd been on Team 2, I was easily averaging over eighty hours a week building 3D levels, and yet the only thing we'd finished was a single goldmine. By "finished," I mean we could load it into the *Quake III* engine (copies of the game floated around the office so others could evaluate my work). It was bizarre running through our goldmine as Quake characters, although it was fun to rocket-jump up to hidden perches along the ceiling. Often I would enter my map and one of the producers would appear out of nowhere to blast me into a pile of guts—followed shortly by guffaws of laughter from down the hallway.

But Karazhan was far bigger than a goldmine, and I was working on it because it was our worst-case scenario. It was so big that *Quake III* couldn't even run the file. Scott Hartin, the programmer in charge of writing WoW's game engine, explained he'd have to write his own compiler to handle our big files, so I continued building Karazhan with the faith that our technology would catch up. But my confidence had been wavering those past few weeks. It took over five minutes just to save the file, and that was a problem because Radiant (an unsupported program) was repeatedly crashing.

I was welcomed to the team with enthusiasm and high hopes that I'd help iron out one of the issues plaguing the project: *how to build 3D dungeons and cities.* Blizzard had zero experience with 3D level design, something I'd already figured out from the questions I was asked in my interview. I could tell they were pumping me for information, such as time estimates and production pipelines for building 3D architecture.

Before I joined, the company had a terrible time hiring 3D level designers, but now that I was on board, I was having a terrible time hiring *other* 3D level designers. Most level designers weren't career-driven—if they found a project that let them work in peace, they pretty much stayed put. So when Blizzard posted job openings with modest salaries on an unnamed project, very few industry veterans applied. They even tried to fill the spots internally with candidates from quality assurance (QA), but that proved a fool's quest because 3D level design skills took years to develop. Each level I'd submitted for my interview took about six hundred hours to create, and all my early work was embarrassingly bad. 3D level design was hard—especially when using persnickety editors like Radiant. It took me years of practice before I got decent, so I can't imagine what ungainly submissions must have come from the QA candidates. Blizzard had plenty of experience with 2D levels, which were heavily scripted, and quickly built through a drag and drop interface. 3D level design for MMOs required modeling experience, a love of architecture, an artistic eye, and months of time.

Brenda Perdion (another 3D level designer) and I were the only people on

Team 2 who didn't go to the anniversary party. We were worried. Neither of us had shipped a game before, we couldn't find experienced level designers (for what the team could afford), and Radiant wasn't producing the kind of geometry we were happy with anyway. If we had dozens of level designers… maybe we could hit our two-year deadline.

But even if we solved all the technical and production issues, the game designers couldn't give us an idea of how long our levels should be—which was something one needed to know before constructing a file that took hundreds of hours to build. Radiant dungeons were very hard to resize, and that created a chicken-and-egg paradox where our game designers (who'd never worked on a 3D game before) needed to run through our levels *before* answering basic questions about how to build them:

Would the chase camera bump into the tops of doorways, and was that all right?

How high would the camera and ceilings have to be?

Would ceiling height prohibit multi-level interiors?

Would the camera change to first-person perspective for interiors, and would that be disorienting?

Would combat be comfortable in a first-person perspective?

How many players/monsters would we need to accommodate combat? How much physical space would characters need to fight?

Would combat mechanics break near elevation changes, such as stairs, perches, or ladders?

Should layouts be linear or nonlinear?

The producer and exterior level designers' area, Spring 2001. The Team 2 area was somewhat tidier than the sink and conference table area. Note the scout trooper hunched over

a drawing board between the four desks. Photo by Collin Murray. Image provided courtesy of Blizzard Entertainment, Inc.

The level designers were also beset by artistic issues. Radiant dungeon geometry wasn't flexible. It produced orthogonal geometry that snapped to a rigid grid with sharp, precise edges. Aesthetically, Warcraft was wonky and painterly—everything was tilted and had soft edges. All the props and creatures were made using 3D Studio Max software, which produced rounded, exaggerated geometry, so the orthogonal Radiant architecture looked as though we were using art assets from another game. The art team adamantly preferred accurate texture alignment, something Radiant couldn't accommodate. None of the artists wanted to paint generic textures, and no external candidates had applied for the job.

The whole reason we were using Radiant in the first place was because it created mathematically clean geometry. All the FPS studios couldn't be wrong, could they? The programmers were worried 3D Studio Max geometry wasn't "clean enough" for the game engine because the vertices in 3D Studio Max geometry had floating-point errors (value inaccuracies), and we assumed messy coordinates might gum up an engine aimed at lower-end systems. After six months of trying to build a world, we still hadn't figured out how to create caves, dungeons, buildings, or cities. In the interest of job security, Brenda and I felt it better to focus on our dungeons rather than to celebrate the anniversary of a company we'd only just joined.

Perhaps it would help if I succinctly explain what 3D level designers actually do: We move things around. That's our job description. We just move things around. We place elements to establish a mood and allow room for traffic and gameplay; we arrange things to make areas interesting and beautiful; we arrange art assets (trees, bones, and other props). Level designers create play spaces like architecture or landscapes. We are a cross-section of disciplines, each with its own rules. We are advocates for lore, gameplay, art direction, and frame rate, and when these goals conflict, we bend the rules to accommodate outliers. The problem with WoW's level design was that it didn't have well-defined rules. Nevertheless, we forged ahead, creating prototype geometry, hoping our placeholder assets would be usable down the road (spoiler alert: they weren't).

The company's founders had instilled the philosophy, "If it doesn't work, fix it." At its heart, this ideology was Blizzard's iterative approach to game development, where nothing was written in stone and everyone was collectively in charge of the game's success or failure. In all areas—design, art, and code—work was redone until it was as flawless as possible.

There was nothing magic about Blizzard; it was simply one of the only

companies in the industry not forced into Faustian bargains with "dumb money" publishers. Because we financed our own games, we could afford to maintain high standards; this was extremely rare and it gave us an important advantage in that we weren't tethered to short-sighted partners with their own agenda. Publishers, distributors, and retailers can take 80–90 percent of sales revenue, leaving little return for the studio to reinvest into its own people (with bonuses) or funding future projects. Studios working with publishers rarely have control over their games, especially the shipping dates, which means polishing is never guaranteed. Blizzard didn't have investors, marketing people, or other non-gamers dictating what to make or when to ship it, or even how it should look. There were no suits. Everyone in the company played games, from the CEO down to our receptionist. We even turned away qualified programmers who didn't play games.

Without constantly answering to impatient investors, Blizzard executives had more autonomy. This freedom meant they could delay or cancel their own projects and turn over more control to the employees building the games. And the fact that management frequently solicited opinions demonstrated their genuine interest in our input. If the worker bees resisted a decision, management put on the brakes and listened. It was still management's call, but the fact that employees had a say in the matter made all the difference. If the executives did something we didn't like or understand, they gave us the reasons for their decisions—usually by giving us pieces to the puzzle we weren't previously aware of, and it usually made us feel better knowing the "bigger picture."

As an example, when *Warcraft III* got closer to its shipping date, the Team 2 artists and designers took days or weeks off from developing WoW to play-test the single-player campaigns. Toph Gorham and I played against each other during dinner one night. Toph was a concept artist who had joined Blizzard on the same day I did, and we sometimes played multiplayer games together after dinner. While he was a great *StarCraft* player, I wasn't. I didn't particularly enjoy the aspect of mass production in real-time strategy (RTS) games and I was overwhelmed by the sheer number of options the game offered, so he and I tested to see whether limiting our army size to a small squadron would level the playing field between us. I thought the fun part of RTS games was micromanaging a battle and using hero abilities, not minding the economy and production, so we played a game with a food cap at 20 to see what would happen. We had a blast! I had more fun than I'd ever had in an RTS multiplayer match. The gameplay was all combat, and the experience was very much like *Defense of the Ancients*, an early predecessor to *League of Legends*. We excitedly ran to the Team 1 area to tell the company's founder and design guru, Allen Adham, and Team 1's lead designer, Rob Pardo, about our experience. These were the same designers responsible for *StarCraft*.

I emphasize here that two fairly new artists felt comfortable approaching the top two designers in the company with an idea to radically change the unit

count of another team's game. Allen and Rob not only listened to us but came over to our desks to see how much of the map we used. They asked questions about how many resources we used and how long our game lasted. Allen and Rob discussed whether gameplay was diminished by lowering the food cap and what else would be affected, and although they didn't reduce the food limit to 20, they lowered it a lot, all based on our feedback.

By repeatedly inviting employees to give comments and suggestions, Blizzard's leadership created an atmosphere where people felt comfortable giving opinions—which wasn't always easy to do because many in the company were introverted and reticent by nature. It took a proactive effort by management to foster a collaborative environment. Comparing this to the bulk of computer game publishers, where projects can be rushed and second-guessed by suits whose visions were limited to what's already been successful, it was no wonder Blizzard games stood out. Since employees were comfortable pointing out each other's oversights (especially those made by the bosses), the pool of talent contributing to products was larger. By keeping everyone in the loop, management maintained a cycle of mutual support. We had monthly company meetings in the QA area, announced birthdays, and disseminated company updates, announcements, or new policies. Without mutual trust, employees don't speak up, and opportunities to improve products are lost. When people aren't personally invested in their work, the result is a soulless product. At Blizzard, most of a title's character came from the peanut gallery.

I noticed this peculiarity on my first day after hearing employees talk about the executives with reverence. I thought they were joking at first, but no one rolled their eyes with sarcasm. They were actually *proud* of the company's founders, Allen Adham, Mike Morhaime, and Frank Pearce. I was told they were very smart, thorough, and patient. When someone pranked Allen Adham by kidnapping one of his office toys, he went to HR and compared writing samples to the ransom note to unmask the culprit. Allen then darkened the doorway of Team 2's database programmer, Twain Martin, with a sinister grin. "So…Twain. Is there…*something* you want to tell me?" Nobody fooled those guys. Hearing my teammates talk about them with enthusiasm was especially strange to me, coming from the politically charged atmosphere of Madison Avenue advertising. In the corporate world, decisions and communications often come from out-of-touch executives whose dubious decrees filter down to employees who have little control over their day-to-day routine.

Blizzard's open-door policy trickled down through the dev teams. People with "Game Designer" on their business cards listened to artists and programmers about gameplay ideas. Programmers tailored their code to suit the needs of the artists and designers. Almost none of us had worked together before, so office politics were minimal. When someone had something new to show, *everyone* gathered to offer suggestions and critiques. The team's

producers encouraged this and went from door to door to solicit opinions. Decisions were sometimes reached in spontaneous discussions in the hallway. For example, there were several team meetings about whether WoW should abandon the paradigm of public dungeons (established by the undisputed king of the MMO genre, *Everquest*) in lieu of private dungeons (called *instances*) that would let players concentrate on monsters without the interference of uninvited party crashers. Instances were a big departure, and designers and producers wanted to hear the pros and cons because the team was split on the matter. The biggest concern with instanced dungeons was that they were antisocial experiences in what was supposed to be a social game, and the meetings about instancing dragged on until we dispersed into little groups and argued about what else needed to be fixed with MMO games, sometimes until midnight.

But as the team grew, our team meetings were getting unwieldy. I was the twenty-first team member in October, and by March, ten more people had joined. We thought we were halfway into WoW's development cycle (spoiler alert: we weren't). The project's co-lead, Mark Kern, explained we were budgeted for a team of forty—although we might get help from QA to create quests that might increase our ranks to forty-five.

There was remarkably little orchestration; the process and structure was more like a garage rock band—people explored and iterated until someone struck a good tune, after which the others would follow. We often spoke in those terms, too—we "riffed" on other people's ideas or "jammed" on a process someone else had discovered. If someone from outside the company had listened to our meetings, they would've been hard-pressed to distinguish the leads from the rank and file. The key to making this dynamic work was ensuring that every member of the team was passionate about their work, which required careful, selective hiring.

What surprised me most about the games industry was how hard it was to hire superstar employees. We definitely found them, but the search was usually long and difficult. The year 2001 began with two new engineers joining the company. The first was our graphics programmer, Tim Truesdale, who started out in February working on in-game shadows. His first task was to see how "expensive" shadows were to render, and Tim offered a variety of solutions. He already had the low-end versions (round spots under creatures) and was about to experiment on crisper, more detailed versions generated from the character's movements. We gathered around his machine in awe of a fuzzy, dark circle beneath Tim's character. Even though it was the simplest visual effect, the shadow grounded him to the terrain and it felt reassuring to see a connection between the player's avatar and the world. Shadows that followed creatures were different from those baked into the landscape, which were called "world shadows." Those were shadows cast by trees, buildings, and mountain ranges, and didn't change shape as the sun rose and fell; they were frozen—although world shadow colors could change from zone to zone

or in accordance with the time of day. Static world shadows meant the sun had to rise and fall in the same direction, which made no astronomical sense but visually looked correct. Tim had already started programming WoW's day/night lighting cycles, although we had no clouds, sun, or stars yet. He had a popular role on the team: Everything he did produced immediate accolades because his code produced visuals (he was easily the artists' favorite engineer).

"He says he wants to write server code for our game; I'm not going to argue with him."

— Mark Kern, a Team 2 co-leader, after interviewing Joe Rumsey

John Cash, our lead programmer, explained that graphics engineers were the polar opposite of network programmers, who performed a thankless job. Network coders labored for long stretches of time where no discernible progress could be shown…until one day when it suddenly worked. It was also unrewarding because network engineers were never given praise; they only received complaints when their code wasn't working properly. The worst thing about server programming was that performance could only be tested publicly, and there were external influences that might contribute to poor performance. Only under the scrutiny of colleagues and fans could engineers optimize server code, so not many people wanted this job. It was among the most important—but hardest to fill—positions in the gaming industry. Joe Rumsey would take the client–server model Collin Murray and John Cash built, and break down the server into separate machines, so the processing bandwidth could be distributed among a master server, a world-state server, a client-gathering server, an update server, and so on. These machines talked to one another in order to support each digital universe, called a *realm*.

When I first joined and learned about the project, Shane and Eric explained that WoW might work like *Diablo*, where players could play by themselves while disconnected from the server (saving us bandwidth costs). They speculated players could solo offline until they wanted to team up for group content such as dungeons or raids—then they would have to connect to our servers. John Cash stood behind Shane and comically shook his head back and forth until Shane asked him why that wouldn't work.

"We can't store information about weapons and monsters on a player's computer because then they're hackable…and there's no way we can stop someone from hacking the client." Shane listened while John continued: "Nothing valuable can ever be on the client: money, items, player flags, player states. Probably not pathing data. We keep all that on the server, where it's safe." John joked about the word "safe" by making air quotes with his fingers. Programmers were typically precise when communicating what they could deliver, and security was something they were careful not to over-promise.

Shane then turned to me and said with a laugh, "Well then, I guess we won't do that. There you go! I wish everything were that easy to decide."

By March 2001, our core programming staff was fairly complete (or so we thought) with a group of seven programmers that also included Jeff Chow (who was on the team before I joined), who was busy making fonts scale cleanly in our user interface (UI), and our tools and database programmers, David Ray and Twain Martin.

I've already said that I absorbed much the first day on the job. One of the first things I learned was how unimpressive games look in their early stages. After someone escorted me to my desk, I looked around the area to see hints of what kind of game Team 2 was making. Game designer Eric Dodds approached me and asked, "Has anyone told you what we're working on yet?" I'd seen some Warcraft characters on the wall and fantasy concept art, but that could have been something to do with other projects, as Blizzard was decorated with remnants of old titles.

"Nope," I answered. "But I think it might be a Warcraft version of *EverQuest*." I purposely didn't sound too hopeful in case that wasn't what we were working on.

Noncommittally, and with an excited chuckle, he replied, "Come with me. This way!" Eric led me to his desk, sat down, and launched an application. After a couple of crashes the screen flickered to a blond man standing on grassy terrain; he was wearing a loincloth and carrying a short sword. The only interface was a health bar and a bag icon. Eric looked up at me expectantly as I studied the screen. He could tell I didn't know how to react, so he showed the character running around. The character ran past some trees and a small ditch with a wooden bridge over it. Eric looked up at me again with a triumphant countenance, as if he were holding a winning lottery ticket. I was very underwhelmed. To appreciate my disappointment, you must realize I'd abandoned my career, friends, and apartment in NYC for this project, and all my previous experience in level design was modding *finished* games. I decided I better say something, and "Wow" was all I could muster. A blond dude in his underwear wasn't particularly interesting, but I tried to look impressed.

Eric interpreted my exclamation as a sign that I'd already figured out the anagram for the game's name. He perked up. "Did you get it?! It's WoW! Right?" I had no idea what he was talking about. He gestured to the screen. "Look at how cool that is!" Underwear Man approached an ogre frozen in a standing posture. It didn't move a muscle. The character hit the monster with his sword, but it didn't react. There were no combat sounds, only ambient noises of birds chirping. Then the human knelt at the motionless ogre's feet. "Look! I'm looting its corpse…although there aren't any death animations, this is what looting will look like when looting is real." I looked blankly at the screen of the man kneeling at the feet of the still-standing ogre statue. Eric explained, "There's nothing in the loot table, of course, because the loot system isn't in place yet."

"Can you run across the bridge?" I asked.

"No. I mean, I can, but I'll just run through it. There's no collision on doodads yet." It was the first time I'd heard the term "doodad" and assumed (correctly) he was referring to the art assets (props) that decorated the environment. Eric continued. "And that is going to be a river"—he pointed to the ditch—"but our water probably won't be in for a long time." I'd never worked on an unfinished game before, and it started to dawn on me how lackluster unfinished games were.

Eric gave me a brief history of the game engine, and I learned that when core navigation (running through forests, etc.) felt solid enough, the designers would prioritize things such as combat, items, user interface, and the basics of gameplay. That would be months in the future because the game was only playable in the sense that characters could cross the terrain mesh; they couldn't jump or collide with trees or bridges, and there certainly wasn't anything like combat, but they could climb hills and see the horizon. Eric showed me concept sketches for the zones, and those began to capture my interest. They were bold concepts (I had not yet learned that the word "epic" was the team's target adjective). We paged through pictures of monsters and war machines, and for the first time I felt that this game could be very cool.

The look: Elwynn Forest, color study by Bill Petras, 2000. A close-up shows the loose brush

strokes in Bill's work. Experienced artists don't treat concept drawings as tight portfolio pieces; they use them as communication tools. Bill explained the value of loose concept sketches: "A lot of concept artists focus on detail work, and that's okay if you're doing armor or things that need it, but when you're doing landscapes or environments all you're really going for is a mood." Images provided courtesy of Blizzard Entertainment, Inc.

The zone art concepts Eric showed me were mostly the result of art director Bill Petras's recent efforts. Bill's specialty was color studies, which were rough paintings that established the mood of a zone or area, and his Elwynn art was the first color study roundly accepted by the team. Even though the direction of Elwynn was brightened up to a cheerier, Utopian feel, the loose, painterly style became the look for the game. Bill emerged as the art lead for the project, conceptualizing every zone and critiquing animations and character creations. Once Bill got a zone concept pitch approved by Chris Metzen, the company's creative director, he took it to the artists who drew the zone's assets: its trees, points of interest, and creatures. In this way, concept sketches were just "art blueprints."

It took both artistic interpretation and technical skill to apply a painterly style to a 3D environment. Bill explained that a newly hired artist named Brandon Idol was the first to nail down the Warcraft style after he painted the textures for the kobold and the gnoll using an exaggerated and comic approach. Before the kobold and the gnoll, much of WoW's artwork leaned toward photorealism, as did other 3D games of the time. Brandon's

interpretation of the franchise helped preserve Warcraft's cartoon-like identity.

Brandon also reworked some of the exterior tile sets for not only WoW but also *Warcraft III*. Since he was a character artist and not an environmental artist, he did this on his own time, just to show an alternative way of painting landscape textures, and it wasn't atypical for artists to redo one another's work. It was important to capture a strong style for ground textures because players generally look downward. Each exterior zone was painted with only four landscape textures (dirt, stone, grass, and rock). Brandon painted each blade of grass instead of using speckled AstroTurf (which every other MMOs used), and the treatment was such an improvement it was adopted by both the *Warcraft III* and WoW teams.

After Tim Truesdale finished engineering external lighting cycles, Brandon would have the opportunity to match the colors of shadows, sunlight, and skies to each zone's concept sketches. Deserts could be lit with warm sunlight, then cool off to blue hues at night, and when players walked between zones, the colors transitioned gradually. These color blends would be the next big feature going into the next build, and everyone was looking forward to seeing whether the transitions were smooth. Lighting and world shadows made the landscape much easier to "read" and allowed the eye to distinguish distance and subtleties in the topography. They added dimension to the terrain, and the result was gorgeous. Our project was ready for exterior level designers to begin building a world.

To find the right exterior level designers, a voluntary task was offered to Blizzard's QA team to create exterior areas using WoW's ubiquitous game editor, called wowedit. Since Blizzard published its own games, we had a few dozen quality assurance and customer support staffers (some were temporary, others full time) who were integral to the company's success—not only for the polish that went into its titles but also as a source of passionate development candidates. The moment someone was hired to Blizzard's QA or customer support team, their only goal was to leave and get onto a development team, whose salaries, responsibilities, and creative input were considerably better. So applying for a position as an exterior level designer was a big opportunity.

The two-dozen exterior level design applicants worked in wowedit after hours and on their own time. The given instructions were, "Create an interesting zone using the available Elwynn ground textures and props." Wowedit was new, buggy, and clumsy, and it lacked major features like auto-saves or shortcuts that reduced repetitive actions. It was tedious and imprecise work, and most applicants had never worked in a 3D editor before; most of them lacked artistic experience, and there were no tutorials. The fact that they'd never learned the self-discipline to frequently save their work, coupled with mind-numbing repetitive processes, meant the candidates frequently lost hours of work whenever the editor crashed. It made the application process

incredibly painful, but the people who wanted the job badly enough spent the most time on their levels and generally produced better work.

After a few weeks, the design and art teams ranked the submitted exterior levels without knowing who'd built them, referring to them only by their number. There were four people whose work was ahead of the pack: Bo Bell, Mark Downie, Josh Kurtz, and Matt Sanders. Josh Kurtz's level was accompanied by a notebook of lore explaining the area. No one read his twenty-five-page document, but the amount of work he put into his story was a sign he would be a passionate developer. We learned that the two submissions that had received the highest marks were authored by the same applicant, Matt Sanders. Matt had served in the Navy and had a reputation for being a hard worker and team player, and after Mark Kern saw who made the two strongest entries he commented, shaking his head, "For whatever reason, military guys always make the best game developers. I don't know why that is. They just seem to have an intuition."

Nobody grins more on their first day on the dev team than someone from QA. Contrary to what people believe, QA people don't sit around playing games all day. Although they're the first people to see new titles, one can't describe their day-to-day routine as fun. It takes meticulous effort to write and verify bug reports. Developers fix bugs at their own pace, after which it becomes QA's responsibility to test and verify whether the proper adjustment has been made. Some bugs are trivial or are duplicates of others; some are fiendishly difficult to solve and take months or even years to address. Other entries aren't even bugs and are dubbed "working as intended."

When a problem is discovered by QA, it has to be verified by senior QA staff members. Josh Kurtz described nightmarish experiences he had isolating a bug that occurred whenever a player attacked a monster in *Diablo II's* expansion. To eliminate the possibility that a weapon was the culprit of the bug, Josh had to attack a dummy monster using every weapon in the game, a process that took hours. Tasks like these might be split among QA people or sometimes they fell to just one unfortunate soul to sort out. After every weapon was checked, Josh reported the results. The programmers or designers would change something, and Josh would then have to retest every weapon and report results again. The developers would change something else, and Josh would need to test everything again to make sure the bug hadn't reactivated. And again. After doing something like this repetitively for hours, for days, for weeks, and sometimes for months, QA drudgery feels less like being in a computer game company and more like a psychological experiment. These entry-level positions are minimum-wage jobs, but people endure the experience just for a chance at getting a development position, becoming a QA lead, or attaining some other non-developer position. But everyone's goal is the same: escape from QA.

Aside from the politics and headaches that pervade this dues-paying atmosphere, there are some major perks to being in QA. Being surrounded by

gamers every hour of the day creates a strange mix of camaraderie in this every-man-for-himself environment. People learn how games are made, and it isn't uncommon for people from QA to move into game design positions at other companies. Full-time QA members are part of company events like movie day, holiday parties, and Las Vegas launch events. But ultimately the best part is working with other people who are passionate about games.

Gnoll and kobold, by Brandon Idol. The gnoll was the first in-game asset that the art lead, Bill Petras, pointed to and said, "Yes! That is *World of Warcraft!*" It was cartoony and colorful and had a character all its own. All monster skins were painted on a 256 x 256 pixel canvas and fit

onto wireframe geometry whose complexity measured only a couple of hundred triangles. Images provided courtesy of Blizzard Entertainment, Inc.

Antecedents: *Nomad* and *Warcraft III*

One of the only remaining screenshots of *Nomad*, June 1999. The player controlled a squad of three characters: a swordsman, a spell caster, and a character wielding a whip. The interface elements were non-functional, as the artists were only playing around with different visuals when the game was canceled. Image provided courtesy of Blizzard Entertainment, Inc.

The *Ultima Online* (UO) fans on Team 1 had talked about making an MMO since *StarCraft's* development cycle. UO had also served as the initial inspiration for Team 2's formation to work on a persistent, massively multiplayer, squad-based tactical combat game called *Nomad*. Players were able to adventure and equip their troops to fight one another as well as AI opponents. Since Team 2 comprised only programmers and artists, their philosophy toward design was democratic. Too democratic. Because there was no one formally in charge of game design, a direction never solidified and development meandered while people brainstormed unconnected ideas. The team's attention was continually torn between *Nomad* and other games people wanted to make. *Nomad's* lack of design leadership drove the project through so many conflicting gameplay compromises that it turned into something that made no one happy. There was such a lack of cohesion at the end of its first year that everyone on the team agreed *Nomad* was a disaster. Attempts were made to save it over the next six months by taking alternative directions, but nothing seemed to work.

When *EverQuest* (EQ) became all the rage, both Team 1 and Team 2

wanted to toss their hats into the MMO ring. Team 1 was bogged down with early versions of *Warcraft III* (which were all eventually scrapped), leaving only Team 2 available to make a pitch. With encouragement from Bill Petras, the lead animator, Kevin Beardslee, put together a presentation for the company's manager meeting, in which top-level decisions were made regarding projects. Kevin was experienced and design-savvy enough to encapsulate what Team 2 wanted to make—a Warcraft version of *EverQuest*. Kevin envisioned *Quake*-style WASD keyboard controls, instanced dungeons, and clear quest indicators to make the MMO experience attractive to casual players. The idea of actually playing Warcraft heroes, at ground level, sounded like a slam-dunk. The lead for *Nomad* at the time was Jeff Strain, who presented Kevin's deck to Blizzard's CEO, Mike Morhaime, and the other executives. In the same meeting, they gave Kevin's pitch the green light while simultaneously killing the hopeless and reviled project *Nomad*. Allen Adham, the company's original founder and CEO, came out of retirement in 1999 to begin as Team 2's game design director since he too, was an EQ enthusiast.

The Warcraft world map, 1999, was painted on the wall of the Team 2 area by Chris Metzen. Image provided courtesy of Blizzard Entertainment, Inc.

MMO's text-based precursors, multi-user dungeons (MUDs), were well over a decade old, but Allen borrowed from *Diablo's* philosophy of making

gameplay accessible to casual players. Allen liked to use chess to illustrate how a simple game could be played at a higher level of complexity, and Blizzard had had previous success with this same formula. Until *Diablo*, role-playing video games were niche titles as far as the broad market was concerned. Games like EQ and UO appealed only to hardcore RPG gamers, so their audiences were relatively small. *Diablo's* success convinced Adham the team could make a friendlier version of *EverQuest* for a larger audience—and that it would still have enough depth to satisfy the core gamers. Furthermore, the success of *StarCraft* in a market already saturated by real-time strategy games proved Blizzard games could still outsell entrenched competition. Using *Diablo's* model of simplistic game design, Allen laid the groundwork for an MMO meant for the masses. Everything was measured in terms of intuition and ease of play.

Eric Dodds had been promoted from the QA department to the *Nomad* project to help out with design, but two weeks after he joined, the project changed into an *EverQuest*-like MMO. As the newest member on the team, Eric was also the first to call the game, *World of Warcraft*, although it was so obvious a title that others may have come up with the same moniker. The apropos acronym, WoW, was only a happy accident. *World of Warcraft* became the placeholder name unless someone came up with something catchier.

WoW's earliest existing screenshot, using the *Warcraft III* engine, 1999. This shot shows that WoW's incredibly humble beginnings were that of a rescripted modification of *Warcraft III*

(because Team 2 began working without programmers on their staff). Image provided courtesy of Blizzard Entertainment, Inc.

By July of 1999, a dozen or so developers began what would become Blizzard's largest project. WoW broke more ground in three months than was achieved in *Nomad's* eighteen-month lifespan. Adham's presence provided the new project with solid design direction, a refreshing departure from *Nomad's* speculative meandering. It was also crucial that *EverQuest* had provided a proven example of gameplay and a common frame of reference. During *Nomad's* development, everyone worked in their own offices and focused on their own ideas. For WoW, the team moved their desks together in the hallway and collaborated. Improved communication reinforced the collaborative spirit: Everybody knew what everyone else was doing. Decision-making was less formal, as "meetings" spontaneously happened throughout the day. Although Allen was in charge, he described the process as "a representational democracy" instead of simply giving everyone equal veto rights. The game designers listened to everyone's arguments but were ultimately responsible for the final decisions themselves. Usually there was an agreement with the producers, as nothing moved forward until they deemed it within the scope of the budget.

One of the initial discussions for Team 2 was to decide what kind of universe to create. Blizzard enjoyed ownership of both fantasy and science-fiction trademarks, but the team was almost evenly split between the two genres, and the issue became the subject of spirited debate; even upper management was divided. Adham finally swayed the direction toward a fantasy setting, selecting Warcraft as Blizzard's MMO universe. His reasons for choosing fantasy over science-fiction weren't because of his personal preference. Most science-fiction games were based on firearms and unrecognizable technology that was less visceral than swords and magic. Sniping someone with a neutron-accelerator over a distance wasn't as intimate or familiar as a toe-to-toe battle with claw and steel. The *EverQuest* and *Ultima Online* hegemony over the fantasy genre led Blizzard to believe (correctly) that the next generation of MMOs would lean toward science fiction. Fantasy settings were easier to understand, were more established in the public mind, and sold more boxes. Most casual customers formulated an opinion just based on a glimpse of a game's box—and fantasy explained itself faster than other genres. Using Blizzard's own brand, Warcraft was an easy choice for a setting.

An early look at WoW, 2000. None of this version's code or artwork exists in the game today. Players could run through solid objects, and the only interaction with the world was running on the terrain. Image provided courtesy of Blizzard Entertainment, Inc.

Valgarde, late 2000. WoW's first test area was drab in color. Note the style of the buildings: Everything was upright and in realistic proportions. Image provided courtesy of Blizzard Entertainment, Inc.

As design was the Achilles heel of *Nomad*, technology had always been the headache with WoW—which wasn't surprising for something as complicated as an MMO. When *Nomad* was canceled, many of its staff left the company—including all the programmers. After fumbling their first project, Team 2 couldn't have started with fewer resources. Most of the company's focus was devoted to making *The Legends of Warcraft* (soon to be renamed *Warcraft III*), and for a year only a couple of programmers were moved from Team 1 to the WoW staff because the plan was to base WoW's technology on the *Warcraft III* engine, so it made sense to keep the bulk of the engineers focused on *Warcraft III*.

While it used the *Warcraft III* engine, programming for WoW was slow and frustrating. Code was temporary because the *Warcraft III* engine was unfinished; no one knew what Team 1's engine could really do until it was written. Only when the engine neared its completion did Team 2 discover that the frame rate performance was way under expectation. Both Teams 1 and 2 were daunted by the arduous tasks of improving flawed engine code, so both

teams decided to start over. The staff was restructured, and WoW gained a coder from the *Warcraft III* team, Collin Murray. Despite the acquisition of Collin, staff morale remained low due to the major delays with the engine setbacks. *Warcraft III's* engine needed to be tailored to real-time strategy gameplay, and optimized for rendering, and for controlling many units at once in small areas. WoW didn't need anything like that—it needed landscapes and large, complex assets such as dungeons and castles to render. It became apparent that reusing the *Warcraft III* engine wasn't going to work for a massively multiplayer online game, and the WoW team had learned enough about 3D engines to know they needed to write their own. Even at this early stage WoW had almost all of its code rewritten at least once.

"The worst game a company makes is usually their first 3D game."

— Collin Murray, Senior Gameplay Programmer

Collin explained to me that when developers apply what they know about 2D games to 3D games, they end up building everything wrong, and Blizzard's mistakes were no exception. When I arrived, level design was still talked about in terms of "tile sets," a 2D term that described the family of textures used to create 2D levels such as those used in *Diablo, Warcraft*, or *StarCraft*. Switching to 3D was one reason why *Warcraft III* took so long to ship and why other game studios were producing unremarkable games around the turn of the century: The entire industry was learning the same lesson. Staffing up for 3D game development was time consuming, because few developers had experience, and Blizzard was simultaneously staffing up on two 3D games, naturally making the teams competitive over resources—but the two projects shared tools, code, and people whenever possible.

Game Engines

A game engine is a software framework used to create and run a game. Before starting a project, every studio must decide whether to write their own engine or start with an existing package, licensed by another company. Pre-written engines offer a variety of attractive features, including cross-platform support, close integration with other tools, a

user-friendly interface, flexibility, and, of course, all the latest graphical bells and whistles. Despite these compelling arguments, Blizzard wrote their own engines because the pros always outweighed the cons.

Pros of Writing a Game Engine In-House

Perfectly Suited for the Task at Hand:

In-house engines are more efficient in terms of processing power because they are optimized from the ground up to perform the type of task that is the focus of the game. If a game needs lots of textures to render at once, programmers can tailor the game to do precisely that. There are no wasted features; if the game doesn't need powerful graphics, the programmers can dedicate the processor to performing other tasks, such as reducing load times or improving the artificial intelligence.

Better Long-Term Profitability:

Licensed engines come at the cost of losing a percentage of future revenue. Writing an in-house engine avoids this, and it opens up the possibility of licensing your own game engine to other companies or giving it away to fans to buoy brand loyalty.

Bigger Audience:

Not only does focused optimization mean that the game will run faster, but it can be targeted to run on low-end computers, which dramatically increases potential sales.

More Control:

Engineers don't need to work with unfamiliar code. Because they know what's going on at the root level, it makes debugging, iteration, and improvisation much easier down the road. New engines can also integrate well with a studio's existing in-house tools.

Fewer Policy/Communication Headaches:

Working on someone else's engine invites communication issues. Writing an engine in-house means fewer cooks in the kitchen, and the studio doesn't need to deal with another development team and work under another company's policies.

Cons of Writing a Game Engine In-House

Longer Dev Cycle and Lower Morale:

Everything takes longer. Artists and designers experience more fatigue waiting for the engine to support their art assets and gameplay. Until the engine is robust, an atmosphere of complacency could reduce productivity. Designers who are unable to prototype gameplay early often cannot answer questions, which erodes the staff's confidence in them, and that's dangerous because they are supposed to lead the team.

More Expensive and Harder to Schedule:

There are far more upfront costs in writing a proprietary engine, mostly in terms of salaries. Not only does it mean hiring more programmers, but also companies can't hire key employees if the project isn't ready for them. This is particularly painful because some specialists are difficult to find. Because engine readiness makes staffing less predictable, the schedules are nearly impossible to keep, which increases the risk of exhausting the project's financial runway.

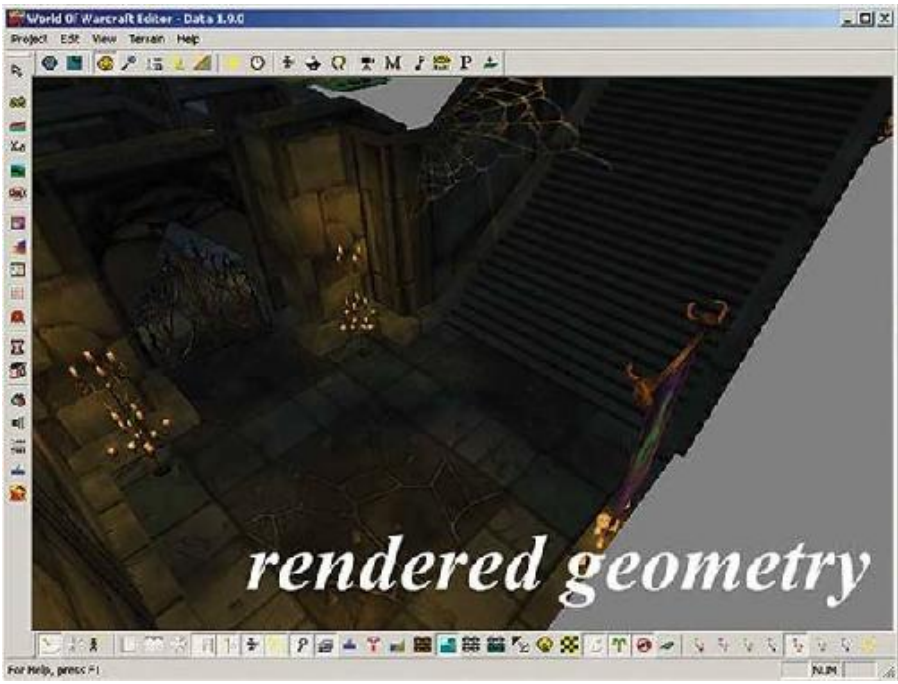
Prototyping Is Harder:

Prototyping can rarely be performed early, and changes can only be made by programmers (which is costly, since their code will likely be throw-away). This means designers might not get a feel for the game until the tail end of the dev cycle. This introduces a risk because a studio might not know whether their game is fun until the bulk of its capital is spent.

Studios make engine decisions early, often before funding. Delays from either wrong decisions or bad programmers could doom the project and everyone's job. Doesn't game development sound fun?

Midway through 1999, Team 2 had hired a veteran 3D programmer, Scott Hartin, who proved to be the perfect person to write the WoW engine from scratch. Scott had previously worked in Japan on console games, although he didn't particularly relish the experience. Scott once lamented, "I hated working in Japan. Everyone worked in rows of desks, silently, all day long. And no one questioned their boss—if you were given five weeks to do a task, then that's how long it would take. If you finished early, you were expected to work on it for another two weeks. And you definitely weren't allowed to work on it longer." He shook his head in irritation at the memory.

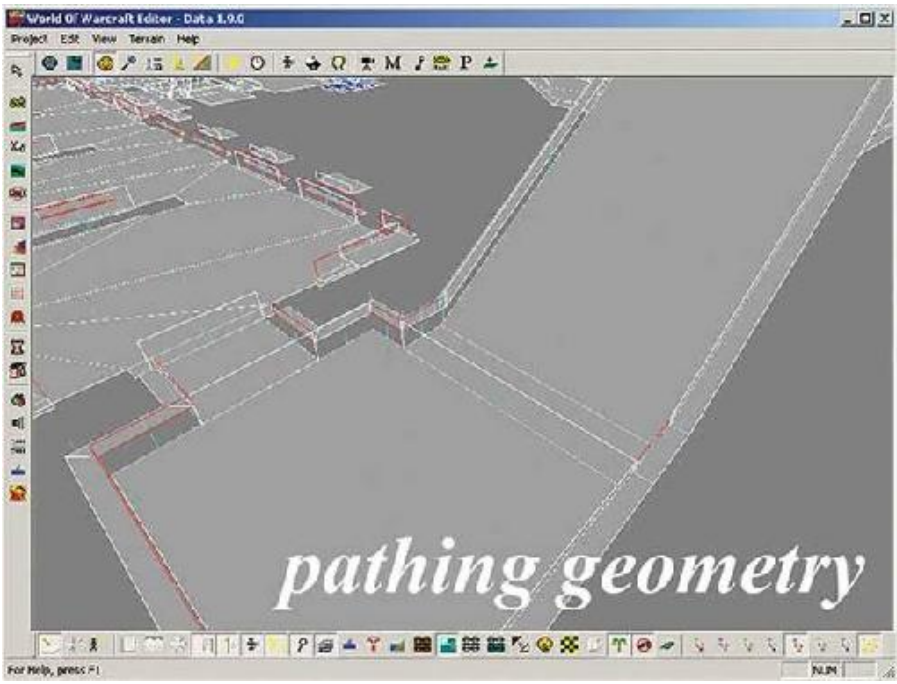
By the year 2000, John Cash had moved from id Software to become Team 2's much-needed tech lead. Even before John joined, it was growing more evident that using other parts of the *Warcraft III* code was unrealistic. John provided invaluable leadership as the handful of programmers rewrote, repaired, and restructured WoW's game code.

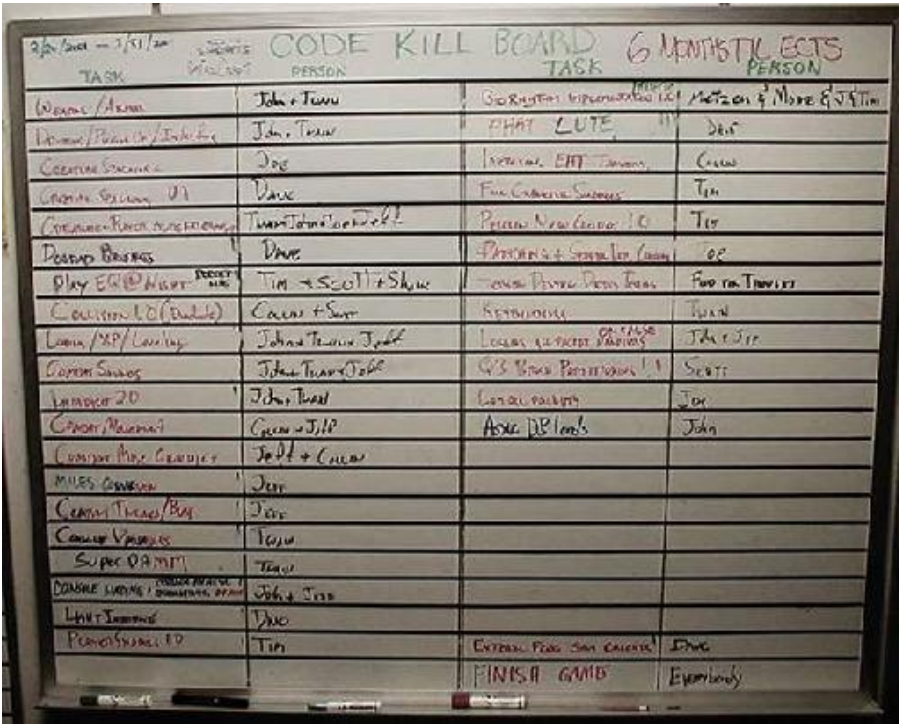


MMO engines process three types of geometry: rendered, collision, and pathing. **Rendered geometry** is visible and includes textures, UI elements, text, VFX, and animations. The frame rate can become sluggish when too many art assets overwhelm the engine's ability to render a scene.

The engine also handles **collision geometry**, which is the invisible force fields that prevent players from falling through floors or walking through objects.

As collision geometry stops players from walking through walls, **pathing geometry** (below) guides monsters around them. Notice that the stairs are simplified to a plane and there's no door (which is why monsters can run through closed doors). "Pathing" is heuristically generated by the game to instruct AI-controlled creatures where they can walk. Since pathing geometry is the only geometry that resides on the servers (there are no 3D characters, landscapes, sounds, or spell effects), software on the server is much smaller than what is installed on a player's hard drive. Images provided courtesy of Blizzard Entertainment, Inc.





A snapshot of the code task board in March 2001. Note that the deadline for announcing the game at the European Computer Trade Show (ECTS) was in the upper-right corner. Mark Kern joked he had pages and pages of programming tasks—so many that it was too

depressing to even count them all. Collin Murray worked on collision with “doodads” (trees, bridges, etc.); John Cash and Twain Martin worked on items and inventory interface. Twain had been doing all of the internal tools that kept track of completed artwork, such as a model viewer that allowed producers to browse and see how completed monsters or animations would appear in-game. Joe Rumsey was working on logging packets on the network code and monster spawning. David Ray was in charge of the world editor and had just finished a tool that applied random sizes to trees, which made the exterior level designers faster. Combat was on the horizon, and Jeff Chow and Collin would soon be working on code that supported player animations. Tim Truesdale was doing the low- and high-end versions of player shadows, and several people were tasked to “play EQ @ night.” Image provided courtesy of Blizzard Entertainment, Inc.

In three months, John and Collin had created a true separation between the client (software used by the user) and the server. This redefined WoW as a multiplayer engine and provided a solid foundation for future work, so now code could be realistically tested with assurance that it wasn’t disposable. Putting the engineering team on the right track did much for morale, so productivity dramatically improved.

Initially, Blizzard tried to write the game using an inefficient language called Java. After Java was dropped in favor of C++, everyone saw a huge boost in engine performance. C++ was far more efficient. The last and largest code rewrite needed was the rendering engine, and by the end of 2000, WoW’s engine was drawing 30,000–50,000 triangles at acceptable frame rates. Even unoptimized, the new engine tripled the frame rate of the *Warcraft III’s* engine while allowing for increased texture resolution.

Scott Hartin had all but solved our rendering pains, but rendering geometry was only one of three types of geometry an engine needed to handle. **Rendering geometry** is anything visible on the screen (what players see), such as the visual effects, the UI elements, the characters, and the environment (including textures covering the surfaces). Too much rendering geometry can slow down the frame rate and earn rebuke from the programmers and producers who want the game to run smoothly. There was also invisible **collision geometry,** which prevents characters from falling through the floor or moving through walls or objects. Finally there was **pathing geometry,** which tells monsters where they can run and (more importantly) where they can’t. Pathing geometry was also invisible, but if rendered it would look like interconnected floor tiles. Pathing code would plague Scott for the rest of the project (he rewrote it over a dozen times), while collision code became Collin Murray’s personal nuisance, harrying him throughout the dev cycle.

We also needed engineers for tracking art assets, so a programmer named Twain Martin, who had written the database for the customer support department, was assigned to the task of converting the early Java files into a database. Since the point of such a system was to always know where the game’s data was located, it was no small irony when WoW’s entire database was lost. While the database system was working, and on the network,

somewhere in the building, the hardware itself had been forgotten and no one could locate the machine when an upgrade became necessary. The predicament was an amusing illustration (to me, at least) of how overlooked database programmers were. After days of searching, it was discovered under an unused desk.

Twain also wrote a system for how art assets could be introduced into the build. Producers guessed (correctly) that our artists wouldn't adhere to a consistent directory structure or file-naming convention (some artists even ignored emails), so a system was needed to allow each of them to save their work however and wherever they wanted. This might sound wishy-washy or disorganized, but it made the entire art team more efficient. There were just too many types of art assets to predict an all-encompassing, draconian naming convention, which would have resulted in either too many directories or complicated filenames.

Another look at WoW's beginnings, running on a modified version of the *Warcraft III* engine. Note that the item inventory was more developed than in the screenshot on page 36, and the looting functionality was now in the game. Aside from the icons, everything in this version was abandoned. Image provided courtesy of Blizzard Entertainment, Inc.

Programmer David Ray co-authored WoW's account database with Twain. David described the three types of database information:

static: a simple list of items and quests (less than a megabyte; our backup was

a floppy disk)

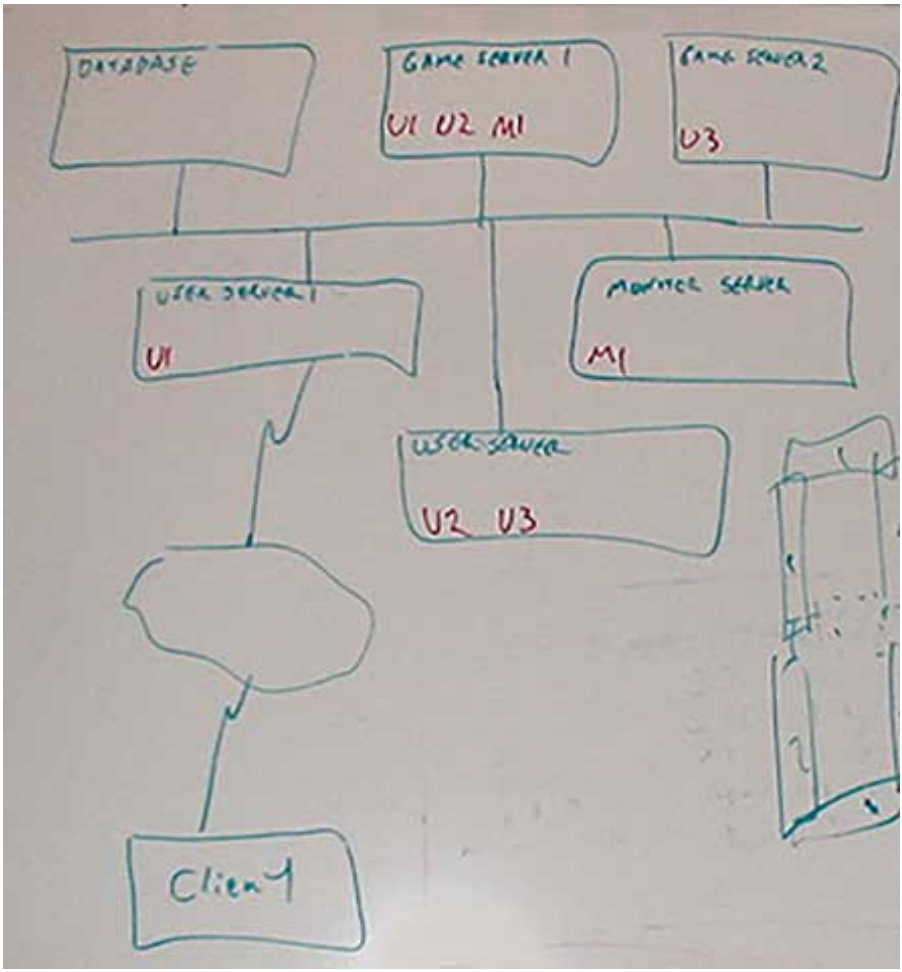
persistent: tracks items and quests (many terabytes of storage)

account: this was handled by the battle.net team

Structuring the files so the game could process data without taking excess space was trickier than it sounded. The hard drives that store player information aren't like the hard drives found in desktop or laptop computers, which are prone to physical failures (such as the spinning motor breaking) or logical failures (such as corruptions from viruses or deleting important registrations). PC hard drives sometimes fail and lose data, which was why they are regularly backed up. But the hard drives used for storing player data cannot lose data. *Ever*. Even reverting to a backed-up state would be a terrible faux pas that would enrage the customer base. No game company can risk losing persistent character information, so the type of hard drives used for MMO data storage are unimaginably expensive. As a result, engineering efforts focused on minimizing both data size and the processing power needed to retrieve it.

David Ray was an aerospace database engineer before working at Blizzard, and he once talked to a fellow database programmer at Boeing who had considered her database large until David described the scope of our game: A single realm dwarfed her Boeing database. WoW had launched with eighty-nine realms in North America, supporting a total of a half million players, each of whom had the potential of making ten characters. Since a single quest used just twenty bytes of storage space, the total server space needed (per quest) was a hundred megabytes. Because quests include things like tracking activated flight nodes, newly discovered areas on the map, and achievements, the entire game's "quests" totaled a terabyte of storage space for a half million players (and characters weren't deleted even if their accounts were deactivated).

Item storage was worse. In fact, bag and bank space was directly limited to server hardware costs. The fact that items themselves had slots (for enchantments and augmentation) further bloated their file size. Some characters looted hundreds of monsters a day, and each looted item had to be stored in order for GMs (game masters, who were the equivalent of customer service representatives) to be able to restore lost items. Since the scale of tracking items was mammoth, the database code needed to be as efficient as possible, and Blizzard had only a couple of engineers to do it.



Initial server blueprint, May 2001. Joe Rumsey gestured to the blueprint on his whiteboard and happily declared, “That’s what our game looks like. Isn’t it pretty?” When someone connected to a WoW server, they were being handled by a number of machines working together. A basic model was sketched on the whiteboard and agreed upon between the programmers and producers. Server architecture took a long time to write, and mistakes in the planning stage could not be made. In fact, networking mistakes could cripple projects or even a company—as many other MMO developers would learn the hard way. Image provided courtesy of Blizzard Entertainment, Inc.

April 2001: Doubts on Journalism

In March 2001, several members of Blizzard attended the annual Game Developers Conference (GDC) in Northern California. The breaking news at the conference was that *Ultima Online 2*, one of the major MMOs, had been canceled. The defunct title would have mixed steampunk elements into a fantasy genre in an attempt to stand out from traditional swords-and-sorcery settings. The death of this steampunk title was another affirmation that Blizzard hadn't made a mistake by competing head-on with existing fantasy games. Allen Adham jokingly gave an "I told you so" to the team members who thought making non-fantasy MMOs would be safer. In this case, the industry was witnessing wavering support for a title with an entrenched *Ultima Online* audience. Even though we considered UO a competing product, its demise wasn't cheerful news. All of Ultima's developers learned about the cancellation and the loss of their jobs at the GDC conference, and it was depressing to know how fellow developers were treated elsewhere in the industry. Publishing deals could fall through at inconvenient times, and this was one of them. Everyone on the team acknowledged how lucky we were to work for such a stable company.

While the convention absorbed the news about UO2, the GDC participants focused on the event. It was mostly a job fair, and its panels were largely a waste of time to anyone already in the industry. The topics were familiar and covered by prominent developers and celebrity Game Gods. Blizzard stopped speaking at industry roundtables because the questions were always directed at us and it made discussion between companies awkward. Couple that with the risk of leaking confidential information, it was decided it really wasn't worth our time to participate.

One show we were definitely attending was the European Computer Trade Show, or the ECTS. We were going because no one else in America wanted to, so when we announced our game, we wouldn't be competing with other US companies for press coverage. In an effort to prepare for the ECTS, Shane Dabiri, one of our two producers, had asked everyone to stay late on Monday and Wednesday nights to prepare. It was the first official push, and a sensible request because there was so much left to do. The more finished our game looked, the higher we'd raise awareness. We wanted WoW to be more finished than any game announced in Blizzard history, but to do this it would take longer hours to get more art and code into it. At the ECTS, we were planning to show off our game to a few magazines (but not to the general public) in a closed room, giving each magazine twenty minutes to ask questions. We didn't show much of the interiors (dungeons) because the technology was unfinished. That was typical of any game—usually studios

only showed off whatever was presentable (devs rarely sat on features). We could, at least, polish our exterior zones and make them presentable.

Fake It Until You Make It

> ***It is very easy to fake a game. As a rule of thumb, the access a game studio provides is a strong indicator of how feasible or finished a game actually is.***
>
> The lowest access is no in-game footage, but just a cinematic of the IP (intellectual property). This usually means the project has been delayed and the developer doesn't have anything to show. MMOs beating the grass for publicity too early often means they're looking for more money or using the press to raise investor expectations (and thereby raise more funds).
>
> The next step up is screen captures. Screenshots can be just smoke and mirrors, so Blizzard is staunchly against retouching any screenshots. Screens are easily faked and rarely show evidence of actual gameplay unless there are interface elements (such as windows or dialog boxes). At best, screenshot-only previews mean the game is a long way from being launched.
>
> A canned movie is more reassuring, but again, the only meaningful footage will be of actual gameplay since movies can be faked to hide poor frame rate.
>
> The next level of access is press-only glimpses of developers playing the game. This indicates that the game will ship and that the frame rate is solid, but since developers are controlling the play, it usually means there are glitches or unfinished content they want to avoid.
>
> Letting the press, retailers, or even fans play the game at events is a stronger affirmation. It not only shows confidence in the gameplay but also speaks to the level of polish in the user experience. These can be done at the studio or at a trade show, although the developers can "stack the deck" by setting up the game on a super-powerful computer.
>
> Letting users download the game on their own system is obviously the best indication a game will ship, since nothing can be faked or hidden.

In my time in the gaming industry, I witnessed a somewhat dubious relationship between game journalists, developers, and publishers. It was rare that magazines or websites gave negative reviews of anything, for fear of being blackballed. Journalists served more in a PR capacity, and it was uncommon for any of them to have development experience, so game companies could easily bluff their way through tough questions: The press generally lets companies hang themselves with their own rope, even if

customers became collateral damage. Devs can usually tell when someone is faking it or making promises (to customers and investors) that will never happen. Such was the common case with MMOs. Many improbable titles were announced that caused many on Team 2 to roll their eyes and shake their heads at the MMO bubble around our industry. The bubble was so big that *most* audience members at a GDC talk raised their hand when a panelist asked if they were currently working on a massively multiplayer online game.

The lack of critical journalism complicates the riskiest part of computer game development, which is the backers' inability to evaluate their investment. This is why many massively multiplayer online games went out of business—investors couldn't tell if they were being scammed until the money was gone. Even if funding comes from a publisher or another game company, which is often the case, only the most invasive scrutiny has a chance of identifying show-stoppers. It's similar to the film industry—a movie's weak link isn't evident until after the film is in the can.

Too often unethical developers would fool the press into writing glowing reviews with exaggerated expectations. These same reviews were used to convince investors to commit even more capital to doomed projects. The inevitable failure could then always be blamed on lack of funds, unforeseen difficulties, or even competing products.

And publishers are always portrayed as the bad guys. Much publicity was made about studios closings, mistreated employees, and destructive executives, but little attention was given to the culpability of irresponsible studios who bilked investors. Sadly, the MMO bubble was inflated with too much dumb money, with everyone trying to cash in on the same success that *EverQuest* was enjoying. Everyone in the games industry knew what a risky bet massively multiplayer games were, and yet ambitious, unwary executives still greenlit scores of them.

Still, the buzz at the GDC did yield some interesting design discoveries that influenced our game. Allen Adham and the rest of the designers were particularly excited about a community simulation game called *Animal Crossing*. It gave birth to the idea of synchronizing our WoW's day/night cycles to Earth's sidereal time, meaning an in-game day lasted twenty-four hours. It spurred discussions about the merit of making players wait for rewards, and that anticipation could be an aspect of both immersion and player retention. The idea of waiting for a tree to bear fruit or a package to arrive in the mail infused our imaginations with what could be done with player housing.

Aside from GDC, people on Team 2 were talking about our new game music, composed by Jason Hayes, who had once been an employee before he started working on a contract basis. Jason was responsible for the ambient music for each zone as well as the main theme that played on the startup screen. Everyone on the team agreed that our gameplay trailer music should be bombastic, like everyone's favorite soundtrack, *Conan the Barbarian* by

Basil Poledouris. After several rounds of musical sketches, Jason developed a main melody that everyone loved, so the producers gave him the thumbs-up. Simple as that, we had our theme music.

Team leads' desks, Spring 2001. Mark Kern and Shane Dabiri (back left and back right) were found next to the exterior level designers (foreground right). Locating the producers in the hallway made them accessible and in the thick of everything that happened.

Mark kept a framed diploma of his law degree on the floor by his desk with a Post-it note on it reading "For sale: $80,000," the amount he joked about wasting to acquire the degree (along with losing four years of his life). Shane sat facing a sign of Chaos Studios, which was Blizzard's second name until they were forced to change it in 1994 due to a conflict with another studio. Its first name, Silicon & Synapse, was changed because…well, because its name was Silicon & Synapse! Photo by Collin Murray. Image provided courtesy of Blizzard Entertainment, Inc.

May 2001:
The Little Engine That Could

Our team had grown to thirty-six people, including our third dungeon designer, Dana Jan. Blizzard was Dana's first job out of college, as we had yet to find an experienced 3D level designer, but his instincts and artistic eye made him a strong prospect for the team. His portfolio consisted of a single, very polished *Quake III* level. We also got our first full-time QA person assigned to our project in the shape of Jason Hutchins, whose job it was to find ways to break the build.

The "build" was the latest version of checked-in code and art. It was an executable file that took a matter of hours to compile. Builds were compiled at least once a day and always overnight. A build may or may not turn out to be stable. Bugs or incorrect data often crashed the game, and sometimes it took weeks to isolate and fix problems that forced the team to use an older version. This became frustrating because it meant everyone was working in the dark, often unable to verify their latest work. Jason checked which systems were solid.

Blizzard is proud of its quality assurance (QA) department, which is probably the largest for any independent studio. Blizzard QA works closely with developers throughout the development cycle, using an internal bug database to log problems, suggestions, questions, and observations for the developers to expedite. At this point, the QA department was drooling over the opportunity to test WoW, but the game was only finished enough for one QA employee's attention. There weren't quests, dungeons, or items yet; the interface, inventory, and combat systems were either rudimentary or placeholders, and there was almost no content close to being finished. But Jason spent his day trying to get the game to crash so he could report it. He worked with Team 2 (and not in the QA area) since the part-time QA staff wasn't supposed to know about WoW yet (even though they did). One afternoon, Mark Kern noticed that Jason's screen had six windows of WoW running. "Are you kidding me? You're able to run six copies of the game at once…and on *that* system?!" he asked, gesturing at Jason's low-end test machine. Jason shrugged and said the game's frame rate wasn't very good, which tempered none of Mark's astonishment. "But six instances of the game on the same system? I don't know of any released games that can do that. That's just amazing!" Mark then turned away to relay his admiration to the programmers.

Preparation was on track for announcing our game at the ECTS, and we were still staying late Mondays and Wednesdays, enjoying the company-bought dinners (which were usually pizza). After Shane Dabiri had asked the executives for money for dinner, Paul Sams, the COO, pointed out that it was

going to get expensive to buy food twice a week. Shane offered to split the cost with the company, theatrically digging into his own pocket. Mike Morhaime shook his head and smiled, as if to say, "You *would* do that, wouldn't you?" They relented and decided it was the right thing to do—if people were volunteering to work late, the least Blizzard could do was spring for dinner.

Tim Truesdale had gotten procedural clouds into the daily build. This meant our sky was dynamic; the clouds moved and changed color instead of a being a static texture painted by artists. Tim was planning on working on water effects next because we had plans for an aquatic player race, called the naga, and we wanted our water effects to be believable. Few games had really pushed far in this direction of producing convincing splashes, currents, micro-particles, waves, surf, and waterfalls, so we thought this might be a chance for WoW to really stand out.

Colin Murray's code supporting collision with objects (so people couldn't run through trees) was going slower than hoped, while Scott Hartin's efforts to write in an automatic visibility solution for the dungeons wasn't producing the result he wanted either. "Visibility," or culling systems, makes games smoother by maximizing the efficiency of the video cards. Culling does this by telling the video cards to ignore areas that are out of view of the player. If a building is far away, the game doesn't "draw" them on the screen until the player gets closer (this is called *view frustum culling*). If the building is close to the player but on the other side of a mountain, the game also doesn't draw it (we call this *terrain culling*). Terrain culling tells the video card to ignore an object until the player has a direct line of sight to it. "Portals" are culling for dungeons, and they tell video cards to ignore rooms that aren't worth worrying about (until the players can actually see into them). Without portals (or another visibility system), the entire dungeon and all its objects and monsters will overload the video card's processor, resulting in a low frame rate.

Since Mark Kern was the producer in charge of programming tasks, he wanted Scott to get interiors (dungeons) into the game as soon as possible, to boost our morale if nothing else. It was hard to work on interior elements if we couldn't see them in-game. So far the interiors were only viewable in Radiant, the tool we used to build them. The Radiant files included a couple of goldmines, Northshire Abbey, Stormwind Gate, the Deadmines, Uldaman, Karazhan, and Tol Barad, most of which were unfinished. It wasn't enough to imagine walking through our levels, we needed to experience them in-game. Looking at unfinished architecture in Radiant couldn't tell us how players would interact with the environment, and combat certainly couldn't be tested. We didn't even know if these spaces would be big enough.

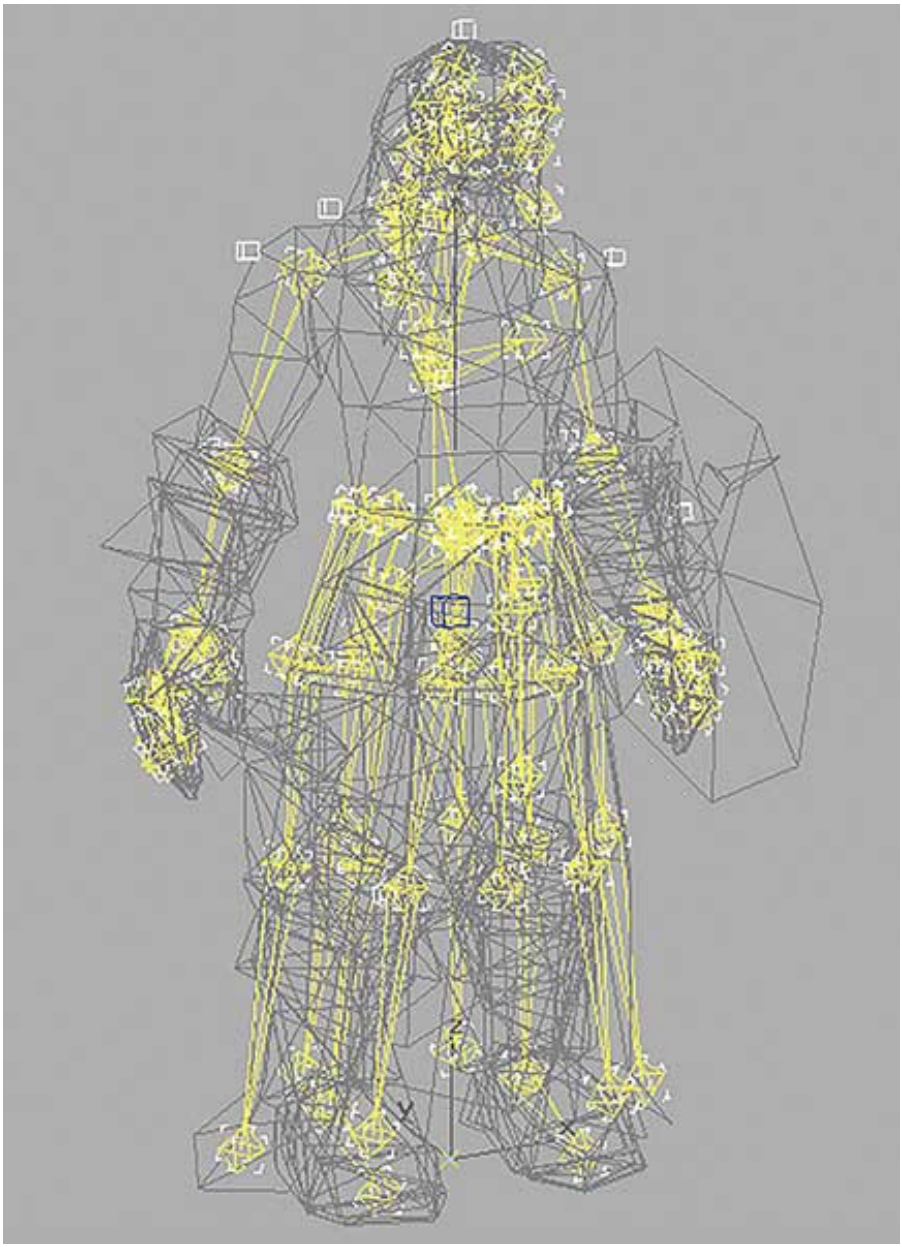
A screenshot showing our male players dressed in their finest visible components (weapons, armor, etc.), Summer 2001. Tauren, trolls, and gnomes were as yet unmade. Image provided courtesy of Blizzard Entertainment, Inc.

Animation

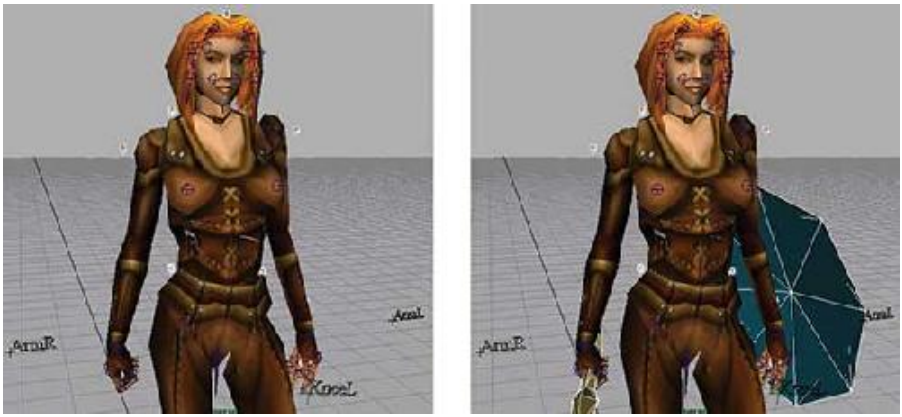
To bring a creature to life, it passes through a multi-person production pipeline. Creatures all start as a series of concept sketches until approval is given for a 3D artist to model and paint it. Before it can move, it needs a series of connected bones and control handles. The process of building this skeleton is called *rigging*, and it's only the first step in animation. Adding animation bones does what one would expect: It groups body parts into a hierarchal movement system that greatly simplifies editing. If an animator swivels any joint, the subsequent extremities follow. If a shoulder joint is lifted, the entire arm and hand move accordingly—if the elbow swings, the shoulder doesn't.

Animations play when a creature changes its "state." If the state is "attacking with a melee weapon," then the animation changes from idle (standing) to a swing of whatever weapon is equipped. There is supporting technology (called animation blends) that interpolates the body positions when a character changes states mid-way through animations, so creatures don't snap unrealistically between movements. Great effort is also spent to prevent a character's feet from sliding on the ground. "Ice skating" dispels the illusion of gravity and being connected to the earth.

There was a debate with WoW about whether to make the hands simplified "mittens" or to allow each individual finger to move. Individual fingers would allow for more refined emotes, such as pointing. But half the team thought the time spent rigging and animating fingers could be better spent on making more monsters. The programmers and producers complained that individual fingers almost doubled the processing power required to animate players in-game, as well as increasing the production time it took to animate. One of our rules of thumb, if you'll pardon the expression, was *get the most bang for the buck,* and animating fingers broke this rule. The decision was probably a mistake, because it meant we could have fewer players on the screen as all the finger animations cost too much processing power. It was only a minor hiccup, but it was hard to know whether wiggling fingers in spell casts might prove to be worthwhile in the long run.



A human male with all the “bones” (in yellow), attachment points (in white), and geosets (in gray) turned on. These wireframes showed all the possible hairstyles, boots, gloves, or skirts a character could have. Images provided courtesy of Blizzard Entertainment, Inc.



Pictured above is a human female with attachment points (white boxes). On the right, a sword and shield have been attached to the appropriate points and tested to make sure they obeyed movements.

We were conservative with these graphical indulgences because they added up and worked against our product's modest system requirements. We shunned technology that required powerful video cards because it diminished our number of potential customers. In WoW's case, we eschewed the popular trend of embracing high-polygon models and tech-heavy character-customization features that were novel and amusing, but after a character was created, players rarely saw the results underneath their armor. Things like minute facial customization wasted programming time and only resulted in slowing the game's frame rate.

Solomon Lee, an animator, had joined Blizzard a week before I did. He was working on a basic orc sword-attack animation when Carlo Arellano, our newest concept artist, saw room for improvement. Carlo had trained with swords and martial arts since he was six and explained that a downward sword stroke was more forceful if the attacker brought his entire body's weight down behind the blade. He stood in the hallway, wielding one of his wooden sparring swords to demonstrate, ending the movement in a semi-crouched, knee-bent stance. He repeated the action many times so Solomon could memorize the motion. Carlo spent the next few days swinging swords in the hallway for the other moves while Solomon reworked his animations to resemble proper swordsmanship.

Some creatures, such as skeletons, had *attachment points* and *geosets*. Attachment points are where shields and weapons are "glued" to the body and are what the movement of the items is based on. If a hand rolled to the left, any held object automatically rolled with it. A geoset is a customizable component that moves, such as a tabard, cape, skirt, or ponytail. If a cape were adhered with a simple attachment point, it would crack or clip into a leg whenever the player ran or sat down.

Keven Beardslee and Kyle Harrison were both highly technical artists as well as first-rate animators. They had already written most of the animation tools that coordinated the geosets and attachment points so they could export and import art between editors and the database. These tools would help convert animations from character to character. Animation tools were written as needed, and roughly six months of work was devoted to them. So by 2001, the animation department was the first to have its production pipeline finished and ready for content creation. This was a good thing because there was a lot of work to do.

There were sixty character animations for the male and female for each player race, giving a total of 720 (adding trolls and gnomes would push this to 960). When Solomon finished an attack animation for the orc male (it took a day and a half on average), he would move to the next orc male animation. When all sixty basic animations were done, he started on the sixty orc female movements. After the orcs were finished, he would begin work on the basic movements of the next player race.

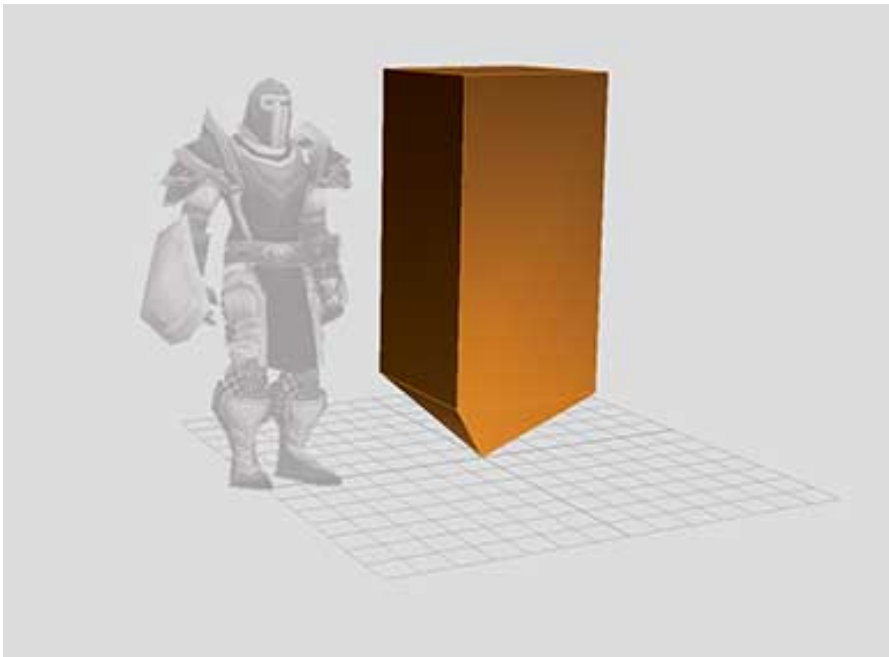
Animations must accommodate all shapes and sizes of attached items (weapons, armor, gloves, shields, etc.). This means the animators must prevent objects from passing through body parts when the characters are in motion. This tedious chore is difficult, since the items are usually made by other artists. Since all of WoW's twelve player character bodies came in different sizes and proportions, each had to be tweaked differently. For instance, the shoulders on each race and gender had to be positioned differently so that bulky shoulder armor wouldn't clip into the character's head when falling or swimming.

While the animators worked on these projects, Brandon Idol and Justin Thavirat were creating the different character faces, skin colors, and hairstyles that offered basic character customization. Justin created items and weapons that fit onto the attachment points; up until now, we had been using placeholder weapons. As artists created real items, they needed to resize them to fit each race because of size differences in the player models. If a sword were held by a tauren, it would become larger; if held by a dwarf, the same sword would be smaller. Each shield also needed to be resized, reshaped, and indexed sixteen times (once for each race and gender), so each variation of the bows, helmets, swords, and armor needed sixteen close cousins. Helmets were the hardest to resize, rotate, and reposition, so no one enjoyed creating them.

We were worried about the animation workload and had already cut the naga out of our lineup of player races because their geometry was too different from the other player races. There was also talk of axing the undead because of our limited resources—but that suggestion was so unpopular with the team that the debate was postponed until the producers had a better idea of how much work could be handled.

Eric Henze was hired as our fourth animator at the end of May to help with the animation workload. Eric came to us from Disney Studios, and he

surprised me with the news that he didn't enjoy working there. I learned that many animators likened Disney to a sweatshop, and the company's dry spell of hits in the 1990s wouldn't have improved working conditions. Eric was immensely talented and confessed he was happy to be working in the computer game industry.



The player collision box. When a character runs up a flight of stairs or slides down a hill, this teetotum shape defines how they bump up against surfaces. The convex solid simplifies collision calculations and is commonly used in computer games. The bottommost point of the shape is where a character touches the ground and represents its true position. Image provided courtesy of Blizzard Entertainment, Inc.

What I liked about our animation team was that they put stock into their opinions. None of them liked motion capture. Mo-cap, they explained, didn't produce the exaggerated movement or personality. Grudgingly, they admitted that starting with mo-cap could save tons of time, especially if there were long animations, but adding personality to mo-caps required a ton of tweaking.

Another thing the animators taught me was that "movement has character." When I first joined the team, I innocently asked if there was such a thing as good animation. Kyle's jaw dropped and his eyes grew wide. "Are you kidding me? There is *sooooo* much personality in movement…" The rest of the animators chimed in, eager to set me straight. At first they thought I was joking, but I'd never worked with animators before and had never given the subject any thought. They asserted there *definitely* was such a thing as good animation and they could immediately judge the quality of a work

within seconds. Kyle used *Jurassic Park* and its sequel as examples. Talented animators needed time to truly give dinosaurs weight and inertia, including "unnecessary" pauses and side gestures to give the animal character. Animals don't move like robots; they get distracted, even when fighting, and it was all these little quirks of movement that made a creature believable (and perhaps the same can be said of live actors). The animators respected how the dinosaurs moved in the original *Jurassic Park* but believed a lot of the personality was lost in its sequels. The sequel's raptors were too single-minded in their quick, jerky movements; they were too focused on their quarry. Well-animated predators checked their surroundings, even during a kill. They hesitated and sniffed the air. They stopped to listen and tested their footing. Good animation was harder and more expensive to realize, but usually movies or games with well-designed characters also had good animations. To this day, I cannot watch animated films or digital creatures without appreciating the characters' movements.

First shot of working hypertext on Joe Rumsey's machine, May 2001. By clicking on a text link, players could learn more about the world. If the player didn't care about anything other than the keywords, they could pursue quests with minimal reading. (It was much later down the road that we began forcing players to read quests and using links for item descriptions.) Image provided courtesy of Blizzard Entertainment, Inc.

June 2001: Milestones Real and Imagined

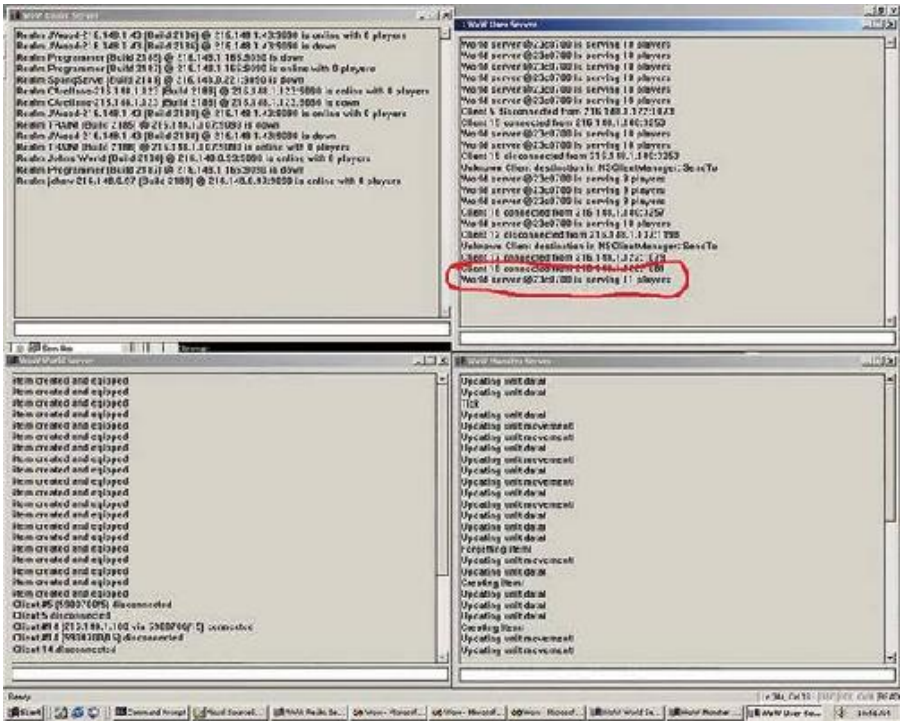
The company hosted quarterly show-and-tells so everyone could keep abreast of one another's progress, and we showed our build of WoW for the European Computer Trade Show in September. The *Diablo* team was shocked at the number of features we'd added in the last three months. The build had clouds, shadows, the day/night lighting cycle (complete with sun and moon), customizable faces, armor components, sword-trail visual effects, and merchant/quest-giver interaction. They were especially impressed, since Team 2 was little more than half the size of their team. There were new buildings and zones and even a character-creation screen. The last time they had seen monsters running around, they were just ghouls. Ghouls were our favorite test monster because they were our only fully animated monster. Ghouls had covered the landscape, and in the last show-and-tell, an exterior level designer, Josh Kurtz, had demonstrated how he could toy with them by creating the first WoW *train*, in which a stampede of ghouls chased him across the world…until the game crashed. It was a hilarious throwback to *EverQuest* hijinks, and the entire team watched and laughed. Programmers murmured about ways to optimize a scene with so many creatures, and artists talked about adding variations to the animations (called *fidgets*) so that the monster movements weren't synchronized like a chorus line.

On June 6, 2001, Josh was part of another unofficial milestone. He and two artists who shared an office (Tom Jung and Carlo Arellano) became the first assholes in the WoW universe! Every morning team members checked out the daily build to see progress with art assets, features, or bug fixes. Josh, Tom, and Carlo knew there would be many people checking out the game because Brandon Idol and Justin Thavirat had checked-in a ton of character skin variations the night before (so that morning's build would be the first to support them). Brandon was their first victim. He went through his morning routine of updating his client before jumping into the game. When he spawned, Josh, Tom, and Carlo began beating on him, killing his character. They "camped" at the default player spawn point and killed Brandon a of couple more times before the joke got old, but howls of distress and laughter could be heard throughout the offices as more people tried to kill the campers and turn the tide of battle. People hurried to their desks to get in on the player-vs-player (PvP) action, and much trash-talking ensued. There were times when working at a game company could be a lot of fun.

The number of people participating in that morning's melee marked the

second time we'd hit double-digit concurrent users (the first was a screenshot of the player races six months before). Concurrency was a big deal because it was a measure of how stable the servers were and how many people could be supported at once.

Double-digit users! October 2000. Before the client–server model was finished, ten players jumped in the engine and took this screenshot to show all the player races. Everyone was in their underwear because armor pieces weren't "remembered" by player profiles. It was too much of a pain to put on clothes because they were erased after the game closed. So for a year, we tested characters wearing only underwear. In the screenshot below, the building in the background wasn't a structure players could enter. It was only a doodad, a placeholder prop, and had no collision geometry. Nor did the architecture resemble the wonky Warcraft style—even the trees were spindly. Images provided courtesy of Blizzard Entertainment, Inc.



Double-digit users…again! June 6, 2001. This was the first time we'd had double-digit users since the client–server architecture was working. Since the October screenshot session, the server had been split into two different machines and was closer to the final form of WoW's server structure.

The Unsung Art of Herding Developers

Mark Kern once remarked that he'd never seen a professional group as sociable as Team 2. We went to lunch together with little regard to whom we ate with, squeezing into the backseats of one another's cars in spontaneous groups. Often our lunchtime herds were so big there was only a short list of restaurants that could seat us. There were remarkably few cliques or departments that kept to themselves, at least not until later in the dev cycle. As the project aged, its employees formed into more regular lunch crews and people ate with members of their own department. During our dinners, most people still circled around tables in the hallway and everyone tried their best to converse about topics that weren't work related.

We had been staying until 10:00 p.m. twice a week for a few months to polish the game for our big announcement at the ECTS, but half of the team stayed later. At 10:00, some played *Counter-Strike* for an hour or so before going home or back to work.

Since I thought of Blizzard as a patron more than an employer, I stayed late every night and put in twelve-hour days on weekends. WoW was my first

foray in the entertainment industry, and building dungeons was what I loved doing. Besides, I was a transplant from NYC and felt out of place in the sunny climes of Orange County. In the four years making Vanilla WoW, I'd never stepped into the ocean despite living so close to it. I was by no means the only person sustaining this crazy pace; many of us worked hard because we simply didn't want features or content to be cut from the game. I hated the idea of reusing dungeons for different locations in the world, and I secretly wanted to build all the dungeons myself just because each one had such a cool vibe. By my thinking, each dungeon had to be great—no matter what the cost. For a few years, level design was my life and that suited me perfectly. By having no life and spending all my time in the Team 2 area, I can say with confidence that generally the hardest workers were the programmers. Collin Murray and Scott Hartin spent many of their weekends in the office. I was a roommate of Tim Truesdale, who often experimented with code and features (on his own time) that weren't on his task list but nevertheless occupied his spare evenings in case he discovered something cool to put into the game. Tim and I often commuted into work together, although the late hours made it difficult for us to establish a regular rideshare rhythm.

Some employees had spouses and children, and no one wanted kids to miss their father just because he worked on computer games. Still, for a few years of the development, the entire Vanilla WoW team worked many late nights, and I think it was remarkable that no one worked only regular hours.

Mark and Shane, the team leads, were very conscious of not burning everyone out because of their experience on *StarCraft*. They had both been associate producers on the project and vowed to avoid pushing Team 2 as hard as the *StarCraft* devs were pushed. *StarCraft's* dev cycle was nightmarish in that the goal posts were always moving. Whenever they crossed the finish line, Allen Adham found room for improvement, saying the game wasn't polished enough, and asked everyone if they could hunker down for a few weeks longer. Whenever the next deadline was reached, another issue would arise and it was extended again, prolonging the crunch of late hours. The light at the end of the *StarCraft* tunnel always turned out to be a mirage. Each "final" sprint collided directly into another. And then another. Fans camped out in Blizzard's parking lot and counted the cars, reporting on websites how many people were working at night. *StarCraft's* drop-dead due dates were missed again and again until it was over a year later. Shane reminisced how people slept in sleeping bags on the floor. Showers and meals were skipped. To this day, few people who served on the *StarCraft* team play the game. Both Shane and Mark agreed that people weren't as productive when exhausted and it just wasn't worth it. Allen Adham's nerves had been so worn out he left the company he founded until Blizzard convinced him to help out on WoW years later. In the wake of *StarCraft's* quality-of-life costs, Shane and Mark vowed they'd never push a team like that, and their solution was to start the late nights early.

Shane sent the following email to congratulate the team for catching up on its goals and to announce the temporary suspension of late nights:

> Okay guys we've been kicking some major ass the past few months with our Monday/Wednesday gig. We are looking pretty good for our scheduled announcement in September. So as I mentioned to a few of you last week we will be cutting off the Monday/Wednesday late-nights until we are getting closer to ECTS. You all have done a fantastic job and I want to say that I'm proud to work with such a dedicated team <weep...weep>. We don't want to burn everyone out at this point since we still have a good hike ahead of us. Also our CGW exclusive preview has been pushed back to August 16 so it gives us a little more breathing room, but doesn't really change our production schedule any. It will coincide more with our actual ECTS build in mid-August anyway (ECTS is the first week of September).
>
> I want you guys to remember a few things. Most companies just make press announcements of new products *without* much to show. **We actually will have a world that you can explore, kill, quest, loot, level, and do it all with multiple players on the DAY WE ANNOUNCE!!** This is awesome! We will completely blow everyone away with the look and feel of the World of Warcraft and people will be amazed at how far we are. Blizzard doing an MMORPG is one of the final signs of the Apocalypse (…I think)!!! The game industry will never be the same after September 2nd! All restaurants will be Taco Bell… I mean Blizzard. And today we celebrate our Independence Day!… a day that will live in INFAMY (is that a good thing?)!!! WATCHING THE GAME!! HAVING A BUD!!! **ALL YOUR BASE BELONG TO US!!!** WOO HOO!!! ZIG!
>
> <steps down from his podium before getting stuff thrown at him.>
>
> Thanks
> Shane

Northshire Abbey, June 2001. The first architectural geometry was finally in the game, created by Jose Aello using Radiant (note the rigid angles). Jose transitioned from the art team to the level design crew, and he could both sculpt the 3D geometry and paint its textures. Image provided courtesy of Blizzard Entertainment, Inc.

Double-digit users wasn't our only milestone. The next was supporting bodies of water—but having water supported by the game engine was different from being able to implement it. Programmers just hacked in a plane of water to test and preview. We would eventually need to define each body of test-water, from oceans to streams that flowed downhill. The only functionality in the water was that it reflected colors and clouds in the sky; the surface didn't react to characters running through it (there were no splashes or ripples), and submerged characters didn't swim—instead players ran across the ocean floor as if they belonged there. It was also far too early for wowedit support: Exterior level designers couldn't create downhill water volumes (such as rivers).

But the team's tool programmer, David Ray, already had a long list of requests. While he wasn't the only person who wrote tools, the artists and designers didn't fully appreciate the list of things being requested. For instance, when David emerged from the first meeting about making a quest editor, he rolled his eyes and said, "Well, we learned today what the designers want to do with quests. The answer is 'everything.' And that's fine with me, you know I'm an EQ junky, but it takes a lot of time to write an editor that does 'everything!'" Whenever artists or designers went to him to optimize his

tools, he would happily decline—"No, I'm not working on anything the producers haven't prioritized"—and that designer or artist would stalk out of his office grumbling. David was in a no-win position. He had every department asking for tools or features and was the bearer of bad news when he told people he didn't have time to get to their "one little request." So instead of explaining his workload over and over to everyone, he would simply reply, "No," with a cherubic smile of maddening glee. His taciturn tactic grated on people's nerves, and when he used it on me, I saw through his trolling and identified his larger strategy: By hamming up his role of "Dr. No," he was training the designers to stop interrupting him with unapproved requests and encouraging them to pursue the proper channels for new tools—which involved asking Mark Kern to weigh their request against other tool priorities. Despite these run-ins, the world continued to turn. Tim Truesdale would become the right engineer to implement the water functionality because the water tools were more graphic-intensive and closer to his area of expertise (although it wasn't long before he, too, was muttering his regret at having spent too long coding wowedit's water tools).

Scott Hartin gets flat-shaded geometry into the world-build of WoW, June 2001. Initially, the architecture did not have collision geometry, so players ran right through walls and fell through floors. A week later, collision was working and Scott was able to show co-workers my goldmine, one of our first interiors, built some nine months earlier. Photo by John Staats. Image provided courtesy of Blizzard Entertainment, Inc.

It wasn't unusual to have other programmers work on tools. Our server programmer, Joe Rumsey, kicked off functionality for the ability editor. Game

development needs lots of tools, and many weren't directly integrated into wowedit—such as Kevin Beardslee and Kyle Harrison's suite of Maya plugins and animation tools or Twain Martin's database code that cataloged game items. Twain's tool tracked everything found on monsters or vendors and allowed every designer to quickly reference the thousands of items in the game.

The third milestone was basic support buildings and dungeons. The Radiant geometry didn't have shadows yet, so it wasn't very pretty, but any signs of progress was good. Enabling level designers to see their architecture in-game was everything. Only then could people review interiors and make decisions. Until that point, the dungeon team feared we were creating throwaway work, which was a far less motivating way to work.

John Cash, the team's tech lead, asked Brenda Perdion and me to come into Scott Hartin's office. We anticipated it was something special because we knew Scott was working on the engine's support for Radiant geometry (the dungeons and large buildings). When we arrived in Scott's office, we saw his character running around in the goldmine, a level I'd begun eight months earlier. Until then, the level designers had only been able to see our levels by loading them into *Quake III*. However, the goldmine was ugly: It was unlit and there were no doodads anywhere. The producers and a couple of other programmers came into Scott's office to see what the commotion was about, and a technical discussion ensued about how to maximize frame rate by culling unused dungeon geometry.

Because we really didn't know how expensive, in terms of processing power, dungeon geometry was going to be, we bombarded Scott with queries (which probably made them regret bringing us into the fold as early as they had). Our questions were wide-reaching: Would every interior be an instance? What does a player see if they look out a window or over a wall? Can we draw both exteriors and interiors at once? What does a player see if they're on the outside world looking into a dungeon? Would they see other players inside a dungeon run? Would other players disappear as they ran into dungeons, and would level designers need to build corners to hide that? Where would the player appear if they jumped out a window in a dungeon to the terrain below? On and on we went.

This is what it was like to build a game engine. Producers worried that if level designers spent so much time and effort accommodating these limitations, it would result in fewer dungeons. John was disappointed that Brenda and I were only minimally encouraged to see the interiors working in the game. The wet blanket covering everyone's enthusiasm was still the central question of whether Radiant was the correct tool for creating dungeons.

Bill Petras, Dan Moore, and Chris Metzen in a city plan meeting, June 2001. People sometimes wore different hats, and Dan Moore was a good example. He sketched, designed, and created items, monsters, and doodads for both exterior and interior areas. Dan, Bill, and Chris were discussing Dan's sketches for Ironforge and the Necropolis (later renamed "the Undercity"). They talked about what buildings were needed and where they should go…but more importantly, what the "feel" of each city should be so that when a level designer was ready to build, they'd start with a solid concept sketch. The point behind concept sketches was that they're fast and cheap to do. It made good business sense to make decisions at the concept stage because changes to sketches were easy and painless. The only lost work was half a day for a single artist. If a dungeon needed to be changed, sometimes it could cost days, weeks, or even months of work. Photo by Collin Murray. Image provided courtesy of Blizzard Entertainment, Inc.

E3 2001

The Electronic Entertainment Expo (E3) is a crowded, deafening, gaudy carousel of game demos, cinematics, and "booth babes." Ostensibly, it provides a place and time for business people to meet up. Developers, journalists, publishers, and distributors all have a chance to get a lot of business done. It's especially important for smaller studios: They need to prepare only once a year to reach journalists and bloggers face to face, saving everyone travel expenses. For devs it's a time to goof off, learn what their peers are doing, and check out cool things.

Although E3 is an annual event, we seemed to be perpetually preparing for it. Buses ferried most of the Blizzard teams from Orange County to the Los Angeles Convention Center, while others drove themselves. The three halls dedicated to E3 contained a deafening roar of giant screens, signs, and booths (some of which were multiple stories tall and large enough to serve food). The Blizzard exhibition featured the latest work of our cinematics department, a promotional short for the *Diablo* expansion and *Warcraft III*. The people who worked the booths and shouted over the din were hoarse by the end of the first day in the three-day trade show. But not everyone on the team attended. A few developers stayed back to work or clandestinely took the day off to spend time with their families.

No one knew about WoW yet, so it wasn't our turn to shine. *Warcraft III* vibes were healthy, as only a few other real-time strategy games were in development that could compare to it. No one was sure whether the game would ship by Christmas, but more than likely the final shipping date would be pushed into early 2002. We saw many *Diablo* clones, especially in the Korean market. To no one's surprise, almost everyone who had announced massive multiplayer games wasn't showing yet. Sony's *Planetside* was the only MMO at the show with impressive visuals. Its battlefields of flying war machines and futuristic vehicles captured our imaginations. All the games were hardware-accelerated, which meant everything looked more polished and no single game surpassed the others in terms of eye candy. It made us wonder if our game's system specifications were too low, and that we wouldn't have enough bells and whistles in our game by the time we shipped.

A recent press release had said Blizzard would announce "a secret project" (WoW) at the European Computer Trade Show (ECTS). The team joked that our PR department was making an announcement about making an announcement. Speculations rippled through the forums about what project would come to fruition, mostly based on the publicized hiring of John Cash from id Software. Most of the guesses involved a first-person shooter in the *StarCraft* universe—which was correct in a way; we were funding an external console project being worked on called *Ghost*. Guesses also included a *Diablo*-type massive multiplayer game. Impatient Warcraft fans asked why

we were working on another project before finishing *Warcraft III*, which had appeared in *PC Gamer*'s "Where Are They Now?" list. Reports of press and fan impatience raised a team's anxiety levels (*Warcraft III* took four years to make), and while this pressure wasn't always a bad thing, it was definitely not the baggage anyone on Team 2 wanted yet. In this light, everyone on the WoW team felt more comfortable working without the pressures of expectations. "Aren't you done yet?" wasn't something we needed to hear. Another reason we wanted more time was to ensure an acceptable frame rate. With *Warcraft III's* technological delays (because of poor frame rate), Blizzard had grown cautious about prematurely publicizing another 3D game. We simply didn't know what we were capable of (within budget), and didn't want to promise something we couldn't deliver.

Mockup interface by Gary Platner and Allen Adham, October 2000. Various mockups using *Warcraft III* screenshots let the developers get an idea of how the interface would feel. Image provided courtesy of Blizzard Entertainment, Inc.

July 2001:
Nine Months Down the Tubes

The biggest change in July was the addition of two new game designers, and this immediately raised the team's expectations of our future progress. We were eager to see more of the game and not just more game assets or engine eye candy. Derek Simmons and Kevin Jordan were promoted from human resources and the support department, respectively. Blizzard had never hired a game designer from outside the company and only promoted them internally, but the scope and technical nature of WoW put that tradition to the test. Game designer Eric Dodds moved out of his office into a conference room along with Chris Metzen and the two new designers. Chris had so many statues and pictures that he still kept his old office and stayed there when he wanted some "alone time" to think (and, as it turned out, he spent nearly all of his time there). Allen Adham, our lead designer, was now meeting regularly in the "designer bullpen" to discuss spell structure, item properties, player-vs-player (PvP) rules, and character campaigns we called "life quests." When Allen was around, decisions could be reached. Our game's components were starting to connect, so it was increasingly easy to study and shape actual gameplay.

Another confidence boost for WoW's design came from an art pass of its user interface. Ted Park, Team 1's interface artist, was busy making our UI look polished for the first time ever, and his efforts were a breath of fresh air. Having a beautiful interface felt great, as if we were working on something real and not a prototype.

The newest MMO, *Anarchy Online* (AO), had shipped at the end of June 2001, so many of us were playing and studying it. We noted the differences and similarities between AO and our own designs and appraised its art and technology. The biggest difference was the amount of patience required to learn and play the game. Its steep learning curve ensured that it would only be of interest to hardcore players, and not the casual audience. Despite the limits of its appeal, *Anarchy Online* had proved that consensual player-vs-player could be loads of fun. We all considered *Ultima Online*'s and *EverQuest*'s PvP systems broken and unforgiving. Until AO proved otherwise, the very idea of PvP was frowned upon by most of the design staff.

Screenshot by Gary Platner and Allen Adham, July 2000. Allen directed Gary about how he wanted the screen elements to look. Their goal wasn't to have final artwork but rather to see how things felt on the screen. They didn't know how colorful or crowded the interface should be or what elements were necessary. They both knew everything was going to be thrown away, but doing iterations either pointed everyone in the right direction or illustrated what not to do. People could point to things and say, "I don't like that," and so forth. This screenshot shows what the early game actually used to look like. Take note of the hand-painted clouds in the sky and the flat horizon. Other elements (like the chat log) were faked in Photoshop. Image provided courtesy of Blizzard Entertainment, Inc.

July 2001 was not a fun month for the interior level designers. The expectation of getting architecture into the main build of the game had been postponed because of major changes in the direction of both game design and technology. The programmers realized the geometry created with Radiant wasn't going to work because it couldn't be streamed, meaning it couldn't be loaded on the fly as players approached interior levels. As a result, cities and buildings required a level load screen or the game would freeze up. This was a deal-breaker because nothing else in the game worked that way. Radiant geometry was just too different from the geometry created by 3D Studio Max (the program used to make WoW doodads, items, and creatures). Radiant structures weren't as efficient because WoW's engine was optimized for 3D Studio Max, which was Blizzard's favorite 3D package. Sometimes it took a long time to figure out that something wouldn't work, so all the interior levels were scrapped. Unfortunately this decision came just after we hired Cameron Lamprecht, our first professionally experienced 3D level designer, who had

come from the first-person shooter community in Texas. Cameron was dismayed to discover that his new job in California would no longer utilize any of his Radiant expertise.

Additionally, the procedurally created dungeons employed by AO were immediately popular with the game designers, who declared that WoW interior levels should follow AO's direction. It was decided an infinite number of generic dungeons would be better than a smaller number of unique ones, sacrificing flavor for quantity. This decision didn't sit very well with the interior level designers. Brenda Perdion resigned, and I felt like following suit. But instead I focused on familiarizing myself with 3D Studio Max instead of entering the fray of debate. My best argument against random layouts of generic rooms was to show we could produce custom-built dungeons in a timely matter using 3D Studio Max, but there was no one on the team to whom I could turn for advice. The artists who used Max used it in a very different way, not optimal for architecture or complex objects such as dungeons or caves. I flipped open my old *Dungeons & Dragons* modules and modeled *The Hidden Shrine of Tamoachan* in a week—not months, but a single week! It was low-polygon and ugly as hell, but at least I had provided an alternative to the "generic dungeons approach." I also knew most of the team were old-school D&D fans, so I banked on nostalgia to reinforce my proposition of custom-built dungeons.

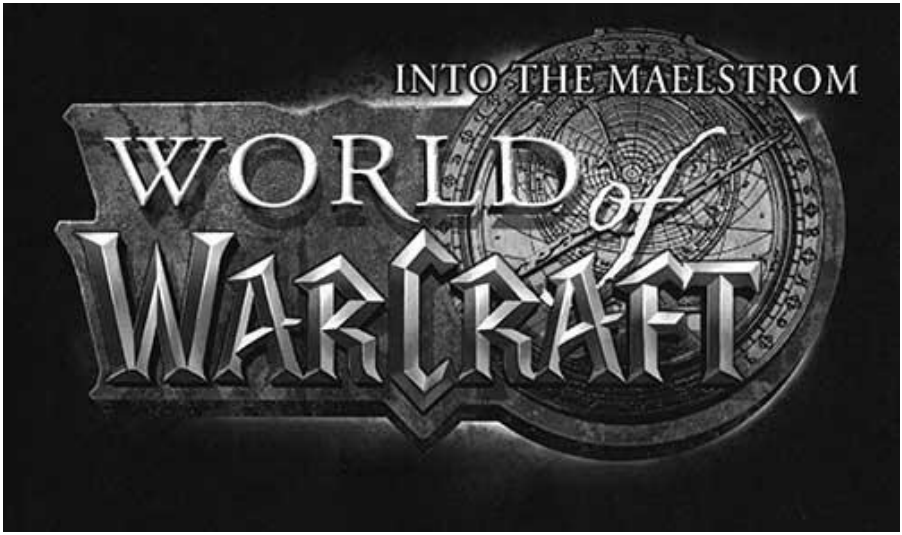
It took only another week until all the proponents for randomly generated dungeons recanted their enthusiasm. They quickly tired of recognizing the same rooms and the overall lack of "place," which ruined the fantasy immersion. They wanted to explore specific places and do things like breach VanCleef's secret hideout or explore the Scarlet Crusade's infamous monastery. My nascent progress in converting D&D modules to 3D objects reassured the producers and game designers we could build dungeons efficiently with 3D Studio Max.

A key hire to the dungeon team was Matt Mocarski, a texture artist from the *Soul Reaver* development team. He had considerable experience with 3D Studio Max and his input was invaluable as we transitioned away from Radiant. The dungeon team went from using a very limited tool (Radiant) to the most robust tool on the market. The dungeon team was finally pointed in the right direction and Matt later proved to be a key recruiter of both Aaron Keller, another experienced 3D Studio Max modeler, and Brian Morrisroe, our second dungeon texture artist.

Screenshot of WoW by Gary Platner and Allen Adham, July 2000. Another iteration showing alternatives of how screen elements could be arranged. Image provided courtesy of Blizzard Entertainment, Inc.

To announce our game, it had been decided that the team's biggest guns would fly to the UK for the European Computer Trade Show (ECTS). The lineup included Mark Kern, Chris Metzen, Bill Roper (our PR guru), and John Cash, the most well-known member on the team. The game was getting increasingly polished for the show and magazine previews, and everyone was getting excited. In preparation for the announcement, we received logos from a marketing firm. The producers displayed them in the hallway, and the team liked what they saw.

July 2001, logo designs from Hamagami Carroll Inc. After some of the Team 2 artists put together initial thumbnail ideas of what kind of identity the game should have, a dozen or so black and white sketches were produced by an outside design firm and sent for review. These two treatments were the team's favorites. The tagline, "Into the Maelstrom" was merely dummy copy acting as a placeholder. Image provided courtesy of Blizzard Entertainment, Inc.



At this point, I want to take a moment to define the role of storytelling in computer game development. Many people have the wrong idea of how lore is created, so I want to clarify a couple of things. First of all, each company handles lore in a different way. But it's often someone high in the organization who is in charge of lore since it's the easiest creative position. The audience is usually forgiving if the storytelling is bad.

Neal Stephenson, the author of wildly popular novels such as *Snow Crash* and *Cryptonomicon* (I unreservedly recommend them both), also wrote a novel titled *Reamde*. This was another geek-thriller wherein the owner of a game company gets entangled in an international adventure. *Reamde*'s main character owns a game studio that develops an MMO game much like WoW (Stephenson even referenced *World of Warcraft* and Blizzard a number of times), but the author's depiction of the problems facing the fictional game studio are preposterous. He describes the biggest threat to the MMO's survival as the company's inability to tell a credible story—one that its rabid fans would accept. What makes this ridiculous is that lore is *never* critical to a game's survival. I began this book on the premise that I would to dispel myths about the industry, so let me lay this one to rest: Computer game stories aren't difficult to write *at all*. Not even remotely. Writing stories is so easy it seems nearly half the people in the industry want to do it.

Many kids who tell me they want to work in the computer games industry say they want to write stories, which is like someone casually mentioning they'd like to become an astronaut or a professional quarterback. Between first-person shooters and cellphone games, entire genres are successful with either cookie-cutter themes or by eschewing lore altogether. The prospect of anyone getting a job writing stories is slim, unless they personally know someone who runs the studio or can contribute to a project in other ways. It's a very rare gig.

Now, before the torches and pitchforks appear outside my window, let me explain myself. When I say, "Storytelling is easy," I'm speaking only about computer games. Writing fiction for books, short stories, and screenplays relies on an entirely different skillset, which is why game studios who sign authors onto their projects are usually asking for trouble. A novelist isn't accustomed to the limitations of game development, and writers rarely make a successful crossover. This is because game fiction has a very narrow range of themes that provide fertile ground for content creation: tropes such as journeys, improvement, betrayals, ancient secrets, power struggles, exploration, and power vacuums.

Subtlety is lost on the gaming audience. Things like socialization, user interface, twitch skills, and character advancement are what players focus on. Games require obvious plotlines and archetypal characters because the

audience is doing several things at once. There is a cacophony of preoccupying issues, so it's unreasonable to expect players to follow a detailed storyline or subtle hints. Storytellers in this environment must wield blunt instruments.

Archetypes are used because inventing unrecognizable or complicated tropes only loses the audience. Making stories easy to understand is where responsible lore writers need to focus. Even nomenclature is important. Names should not be mispronounced. *Ragnaros*, *Arthas*, and *Lordaeron* are good examples of easily pronounced (and easily remembered) words, and all the Warcraft monikers followed this approach. It was a skill the audience wouldn't appreciate, unless the lore was poorly written, and bogged down with annoying names.

The Blizzard lore bibles reside in Chris Metzen's office, 1994–2001. Most of the drawings,

maps, and stories don't actually make it into Blizzard's games. Chris often forgets the names of everything, so he refers to his old ideas and drawings, often making up something new to avoid digging for it. He was flexible enough that if he forgot an idea in a concept meeting, people would pitch their own. Unless there was a thematic conflict, he'd approve any concept that added flavor to the world. Photo by John Staats. Image provided courtesy of Blizzard Entertainment, Inc.

When players say they love a game's story, what they usually mean is they enjoy the *immersion*. An immersive environment allows for easy escapism and there are many contributing factors, the least important of which is the story. Games like *Half-Life* are famous for their "stories," yet the narratives aren't particularly unique. What people liked in *Half-Life* was the believability of the game's creature behavior, nonlinear problem solving, open level design, and reactive environment. Providing players with satisfying feedback to their actions connects them to the gameworld. Examples of this are destructible walls or creatures that react when repetitively clicked (like the emote sounds in *Warcraft III*). Chopping down trees to reshape a forest map fuels the fantasy that the player is part of the gameworld. A strong frame rate increases responsiveness and lets the player forget they're staring at a computer screen. Reducing Internet lag or mouse latency lets people ignore real-world issues like hardware deficiencies. A responsive or unobtrusive interface helps with escapism, while well-done artwork, voice acting, and sound effects embed the user in an alternate reality. Credible level design is a huge factor, especially if the environment makes sense: "Does it look like monsters live and breathe here?" Also, character design, sounds, and animation make a world feel lifelike. These are the fantasy deal-breakers, and if this book is testament to anything, I hope it shows how difficult it is to pull these things off on time and within budget. Stories are the most flexible part of the equation, and matching them to fit the constraints of game development is what makes for a great computer game creative lead, not simply coming up with ideas in a vacuum. Bad storytellers ignore these limitations.

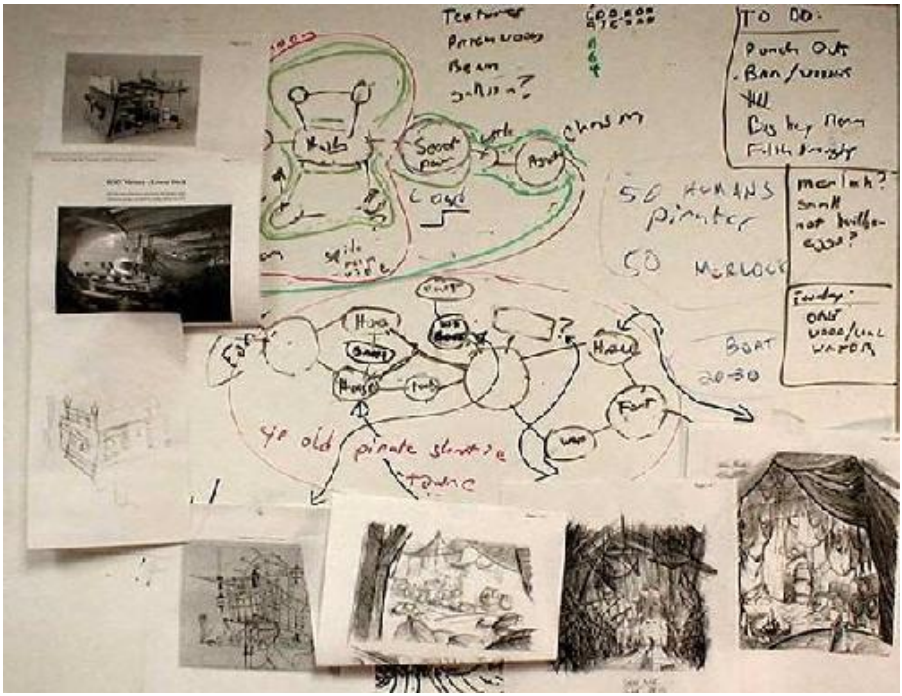
This then begs the question "What makes a good storyteller?" For computer games, a good storyteller has a solid "read of the room" and has earned the trust of the dev team and knows how to inspire people. A good game storyteller has a reputation for flexibility and surrenders the details to the worker bees, empowering *them* to add to the game universe. Good lore designers foster an environment where people are comfortable pitching their own ideas or questioning whether the narrative makes sense. Creativity is common in the games industry; getting a group of creative people behind a single story takes a rare and uncommon diplomacy.

This litany of what makes a great storyteller brings us to Chris Metzen, the person behind every Blizzard universe and perhaps one of the most inspiring people I've ever worked with. He has the qualities a company would want in a creative director: approachable, flexible, diplomatic…but I think we covered all that. Originally, Chris was hired as an artist/animator. When

Joeyray Hall (longtime cinematics guru at the company) first saw Chris's portfolio, he insisted the company hire him that day. Anyone could tell he was passionate about stories just by looking at his concept drawings. He didn't just stick an ax in a warrior's hand; he decorated the weapon and weathered it with nicks and dents from battles past. His characters were covered with tattoos, ornamentation, sigils, and scars. He was an artist with too many ideas, whose brain worked faster than his hand. Although his job was to make art and animations, he began writing stories for his 32 x 32-pixel characters that were well beyond the scope of the game. He did this in his free time—and even worried about "getting into trouble for wasting time on useless stories." Thankfully, Blizzard was a place where coolness usually rose to the surface, and a couple of his stories were included in the game manuals, almost as an afterthought, thereby beginning Warcraft's world. Those seeds ignited the players' imaginations, and so he did the same for *Warcraft II* and *StarCraft*, which complemented the company's ambitious cinematics. He then inherited the Diablo universe, and five years later, Chris was the creative director for *Warcraft Legends*, which was later renamed *Warcraft III*. For WoW, he was the world-architect of the project. He bounced ideas off people in meetings and organized everything on paper. Almost all ideas for the personalities, races, monsters, dungeons, and zones came directly or indirectly from him. Chris freely admits there were limitations to storytelling. He joked that there was never finality, that none of the characters really died; it was like comics in that there was always some way of bringing superheroes back. Anyone who knows Chris Metzen knows that he *knows* comics (his favorite superhero is Thor). From the baseboard to the ceiling, his office was covered with autographed comic book posters, replicas, and illustrations—as if someone dropped a Thor-bomb in his workspace, covering everything with red, blue, and yellow.

Chris kicked off meetings with the main "hooks" he was going after. For example, the first dungeon I built was the Wailing Caverns. He would say the vibe was "The Isle of Dread," which was an *Advanced Dungeons & Dragons* module from 1981 featuring dinosaurs. He described a druid at the end of the dungeon, who was dreaming monsters into existence, and that the final room was "the vibe of the crone-cave in the film *The 13th Warrior*." The game designers asked if there were specific bosses he wanted and he'd shake his head. "Nah, just rock 'n' roll with whatever. Keep it bestial. It's all good." After everyone understood what flavor he was going on about, he'd leave the meeting so the team could figure out the nuts and bolts of combat. If he had conceptualized every boss beforehand, it would have taken longer to create. As an experienced game artist, he was sympathetic to being efficient by repurposing existing monsters into larger, unique, "named" versions. Practical solutions like that weren't always common in the industry; there are a lot of creative directors who aren't so reasonable, and it makes a huge difference to have someone flexible leading the team. The devs who spent weeks or months

building or scripting an area often authored more suitable creative solutions than someone further from the process. Chris knew this and trusted his team with artistic control. It was his job to hold it all together. Although Warcraft was his brainchild, the entire team molded the game into an interesting, credible, and internally consistent world.



Deadmines whiteboard and concept art, May 2001. Bill Roper's initial idea of the Deadmines fit into Chris's world, so it found its way into the game. Tom Jung provided Dana Jan with the ideas for dungeon flavor. Notes described adversaries. At one point it was going to be a pirate cave, but in Stranglethorn we were already doing pirates who were both hostile and neutral, so the antagonists became more like a thieves' guild or a hole-in-the-wall gang.

When the level was ready to be built, the dungeon was discussed in a concept meeting. A simple flowchart was created afterward, breaking down the Deadmine's major divisions so everyone had an idea of how big or complicated it would be before level designers invested months of work in its creation. Surrounding the flowchart were printouts of photos found on the Internet and concept art drawing giving everyone an idea of what kind of dungeon Dana would build. Image provided courtesy of Blizzard Entertainment, Inc.

August 2001:
The Trials of Self-Promotion

"Everybody get back to their places!" Mark Kern shouted down the hallway. After spending two hours filming a scene of characters running together downhill, everyone's patience was stretched thin. A dozen or so people were trying to film scenes for a gameplay trailer (to accompany our announcement), and no one liked the results. "Get ready! One, two, three—go!" After a few moments, groans and recriminations erupted. "Who didn't go?! We have two people not running!" Onlookers quietly chuckled and shook their heads at the debacle. Shane Dabiri was on the other side of the building, filming in a cinematics office. Someone leaned into Shane's temporary recording studio and explained that not all the actors in the game had speakerphones. Once again, shouts carried through the office hallway directing the actors to return to their places. While the programmers shut their doors, the easily distracted artists gathered to watch the train wreck but just as quickly grew bored watching the process. As in movies and television, the majority of time spent on a film set wasn't spent filming—it was an exercise in waiting for everyone to get ready.

On the screen about a dozen or so team members had orc and human characters dressed in our newest armor pieces. Devs considered it cool to be in-the-know about the latest features, cheats, and art assets, so everyone was on the lookout for the latest fashion statements. If someone knew about a new helmet, they'd put it on to show off.

News traveled to Shane's makeshift studio that someone had crashed and couldn't log back on to the server and there was no way to know how long it would take for them to get back into the game. He talked into his phone, which was conferenced to half of the actors. "There are too many orcs, some of you guys have to be human!" After a brief standoff, someone relented and changed to a human character. "We need to get the sun on the horizon!" someone said on the speakerphone. "Shane, make sure you reset the time of day before you yell 'action.'"

August 2001, Shane recorded clips for the first WoW movie demo in a cinematics office. With character nameplates turned off, no one knew who was who, which made direction more difficult. “Okay, now the orc on my far left needs to move forward…no, not you, Mark. The other side…Go back where you were, Mark. Okay… who is that orc? They’re not moving. Can they not hear me? I’m setting the time of day to morning—hold on—okay, when I count to three I want everybody to run forward…No, not yet! Everybody get back…” Photo by John Staats. Image provided courtesy of Blizzard Entertainment, Inc.

We learned after losing an entire day to filming that we needed a smoother camera. Our game’s frame rate was great, but the in-game camera was designed for playing, not filming, and its jittery mouse-controlled movements didn’t look very slick. Days later, after programmers delivered a smoother joystick-controlled camera, the footage was reshot, yet the results only supplied a few seconds of in-game footage.

Days later, Shane played the recorded footage with overdubbed combat sounds and Victor Crews’s music score from *Warcraft III*. For the first trailer, it was decided to cut down on the choreography and just show characters standing or fighting in place. We saved the bigger battles and choreographed “*Braveheart* charging scenes” for a later gameplay trailer, when the game was more robust in features and art assets.

Blizzard veterans knew that our screenshots would be subjected to intense scrutiny by the fans, press, and industry peers, so we too over-analyzed everything. We were also wary of reusing icon art borrowed from *Warcraft III*, which had considerably more public exposure. We worried our game wouldn’t look robust if fans recognized the same icon art (we were later

relieved to learn fans liked seeing familiar icons). We also held back on all our game's details. We didn't want to give away too much because of the PR mistakes we made with *Diablo II:* When the game finally released, everything about it was already old news.

Allen Adham sat with Shane at his desk in the hallway and perused hundreds of screenshots under consideration for the impending ECTS announcement and upcoming magazine spread. Like Pavlov's dogs, the dev team knew *when Allen was at Shane's desk, it was a time to check out new things!* People gathered behind them to eavesdrop and, of course, to offer their unsolicited opinions. Allen and Shane remarked on the beauty of the screenshots. After a while, Allen got up to leave and said to the crowd behind him, "I would give anything to be a fly on the wall in the *EverQuest* offices after they see these screenshots. You guys should be very proud of what you've accomplished." The screenshots were so good, we were feeling cocky. The crowd around Shane's desk laughed and stirred with excitement. Praise from the company's founder eased tension after years of covert development. It was easy to interpret the team's mirth as hubris and not as what it really was —nervous laughter. Allen's remark was encouraging and he meant it to be, because expectations for many members of the team were only *cautiously* hopeful. Blizzard had been disappointed before by initial reactions: When *StarCraft* was originally shown running on the *Warcraft II* engine, it was panned by the fans and critics, who rightly accused it of being *Warcraft II* re-skinned. (This prompted Blizzard to rebuild the game from scratch.) After years of being muzzled by secrecy and working without encouragement, the last thing the team needed was a negative public reaction. Hearing accolades from Blizzard's founding father was pure motivation.

August 2001, Solomon Lee and Justin Thavirat watched the footage being recorded on television. Justin shook his head in disapproval. “This is going to look so cheesy with only seven guys running down the hill. We need an army charge like *Braveheart* or the *Warcraft III* trailer.” Solomon, too, looked worried. Shane Dabiri, operating the camera, disagreed: “Well, we only have a few people…and look at how cool that is!” Photo by John Staats. Image provided courtesy of Blizzard Entertainment, Inc.

"Anything is possible. It's just a matter of how much time we want to spend coding it."

— Collin Murray, lead gameplay programmer

Throughout the dev cycle, people suggested all sorts of gameplay ideas to add to the mix because MMO games are everything to everybody. To curtail this river of "feature creep," the programmers give implementation estimates to anyone suggesting new ideas, but it's the producers and designers who prioritize programming requests.

Producers are a strange mix of boss and assistant. In lieu of an ability to create art or code, their primary attributes include communication and organization. They prioritize tasks so that artists, engineers, and designers have what they need to be productive. Producers are the oil that keeps the machinery running efficiently, because the three aspects of development—design, art, and programming—are often at odds with one another. Designers want features that require engineering time. Programmers want the game to run smoothly. Artists and level designers want the game to be beautiful. Producers help these three factions work together to get what they want. When programmers complain about the frame rate going down because artists or level designers are using too many polygons, it's a producer who weighs in as the third-party arbitrator. When artists complain they aren't getting the tools they need to produce assets efficiently, it's the producers who decide whether it's worth pulling programmers off their tasks to give the artist what they want. When designers request features or art assets, they go through producers so the engineers and artists don't get overloaded with tasks.

This balancing act requires both patience and diplomacy. As the producer in charge of programming, Mark Kern once explained how he got realistic estimates from his team. "If you ask an engineer how long it will take to do something, they'll likely give you a conservative estimate, one that pads their schedule with premature optimization so they can check-in perfect code. The secret to seeing a bare-bones implementation early is including other programmers in the discussion—since engineers are naturally competitive, they'll shoot for a more aggressive projection in front of their peers. That

way, we get to see things sooner and worry about optimization and bugs *after* the designers are done iterating on the feature."

Producers were also the team's protective armor. If upper management had unreasonable expectations, the producers would impress upon them the various factors and conditions. Budgeting and scheduling was partly a negotiation. In turn, they were advocates of upper management when the team didn't understand company policies, budget decisions, schedules, or resource limitations. Producers essentially supported and empowered every department around them to make sure development was kept on schedule.

This isn't to say upper management was ever an adversary to development. On the contrary, the easiest and best answer for why Blizzard is the best computer game company to work for is its upper management. It's no secret in the games industry that bonuses are usually a joke, an empty promise publishers or studio heads dangle in front of developers to incentivize eighty-plus-hour weeks out of them. Most (if not all) of the experienced job candidates I'd interviewed at Blizzard rolled their eyes when I mentioned that the company's bonuses were based on profitability. Apparently, Blizzard is rare in its commitment to sharing profits with employees.

Collin Murray once told me why Blizzard is able to regularly award bonuses based on the past year's profitability. The company's previous owners had refused to give bonuses after *StarCraft* had shipped. This was especially insulting after the entire company had crunched insane hours for almost a solid two years. Despite the product's success, the upper management couldn't get our parent company to budge on bonuses, so the top ten most senior people of the company threatened a walkout unless a structure of guaranteed profit-sharing could be established for all of its employees. The top brass didn't need to do this—they were well taken care of in their own right, and yet they threatened to walk away from the almost guaranteed success of all future *Diablo, Warcraft*, and *StarCraft* products to make sure everyone shared in the spoils.

In contrast, it is a standard industry practice to fire developers to *avoid* paying bonuses. Studios would often rehire the same people for the next project, creating a mercenary environment where wary freelancers negotiated for more money up front. While each extreme was a viable business model, there is something lost when workers and management don't trust each other.

As the team grew in size, Mark and Shane Dabiri (who was in charge of prioritizing art tasks) were getting overloaded with new responsibilities, such as representing the team for interviews, negotiations, and event planning such as the ECTS and E3. By May 2001, it was apparent that content creation was ramping up to the point where a new producer would be needed to manage it all. Both the interior and exterior level designers interviewed half a dozen candidates from QA and the support teams to choose a content producer. It was strange interviewing someone to manage our department, but the two groups decided to go with someone with formal management training: Carlos

Guerrero.

Carlos was gregarious and enthusiastic and would shield the other producers from the many complaints emanating from the level designers. As with all managers, complaints fell onto the producers' ears. This included the unrewarding chore of ordering, cleaning up after, and often delivering team dinners. Employees working long hours were unreserved in their criticism when the food choice wasn't to their liking or if it arrived late, and they often ate dinner elsewhere to demonstrate disapproval. Whenever producers splurged or introduced variety, such as Chinese food (Pick Up Stix) or Thai cuisine, there were always dissenters. This was why pizza remained the staple of our diet. Hours after everyone had eaten (or walked out in protest) it was left to the producers to clean up the disgusting offal of leftovers.

"We've learned a lot from battle.net over the years, both good and bad. Hopefully we can use that knowledge here . . ."

Computer Gaming World magazine highlights our simple user interface, 2001. Showing our UI in print prompted several games to copy it before we released. This is another reason why previewing games too early can be a bad idea. Image provided courtesy of Blizzard Entertainment, Inc.

First Contact: CGW Magazine

On Wednesday, August 15, 2001, *Computer Gaming World* (CGW) came into our office for our first meet with the press—although the issue covering us wouldn't be available until after WoW was announced at the European Computer Trade Show. Luckily, CGW proved to be very professional and kept a lid on our secrets until the ECTS, which was uncommon in our leaky industry. We showed the human, tauren, and orc races, and (surprise!) a ghoul. We were sitting tight on the other races and zones, and we weren't showing dungeons because we had none. The whole team was pretty stoked and nervous; not a great deal of work got done the day the producers showed off the game to our visitors. CGW saw the movie we filmed and a ten-minute demo of a character casting spells, a walk-through demonstrating how a quest would work, as well as the killing and looting of monsters.

CGW sent two editors (not just reporters), and their reaction was very positive. We showed only our polished areas (the first four human zones), so they weren't utterly blown away, but we could tell they wanted to see more. They were most impressed with the easy interface, and two of their most challenging questions were no-brainers for Shane Dabiri to answer. First, they wanted to know if we had the financial resources to back a project this big. Little did they know, WoW was only one of six titles Blizzard was producing —*Warcraft III, Ghost, Diablo III*, and two other projects at Blizzard North (the San Mateo studio that made the *Diablo* series) that were in their own stages of cancellation. Second, they asked if we were ready to support a large online community. We were. Blizzard's battle.net was already the largest online game community in the world (between *StarCraft* and *Diablo*), many times larger than all other MMO games combined (i.e., *EverQuest, Asheron's Call*, *Anarchy Online*). But the overall tone of the visit was that we hadn't shown them enough, so the producers broke down and showed them in-progress areas outside of Ironforge long before the dwarven city was built.

There were problems with the CGW cover art. After their visit, the editors told us they had received negative feedback about our screenshots serving as cover art. They wanted high-resolution, high-polygon game art because their readers (and, sadly, much of the industry) believed high-polygon models meant "Next Gen!" They were surprisingly unhappy with screenshots of the game—neither the close-ups of our low-polygon characters nor the landscape scenes seemed to grab them. The magazine suggested that we leave the cover art to one of *their* illustrators and that tripped all our alarms. We decided it would be safer if our art director, Bill Petras, did it himself, even though his plate was full. With colored markers, the artists sketched out character poses on the office windows and whiteboards. They wiped off what they didn't like with their fingers until they found something simple that worked. An orc. Nothing said Warcraft like a big green orc.

Announcement at the ECTS

The Blizzard.com website ran purposefully vague teasers for four days before our announcement in Europe, and speculation was hot and heavy about what our new project would be—until a fan discovered the domain name of worldofwarcraft.com registered to Blizzard Entertainment. This clue shortly followed the accidental early release of company-to-company newsletters describing our game. The leak about our unannounced title came from Vivendi executives (Vivendi Universal was Blizzard's parent company) who weren't aware of our project's secrecy. It really wasn't anyone's fault; there were just too many departments and companies involved to maintain radio silence on such a hefty enterprise.

The spoiler disappointed us because our PR machine had been running so well until the last minute. After years of polishing, preparing, and telling our friends "mum's the word," all the juiciest details appeared on gaming websites beneath the headline "Leaked." The PR leak and the outed domain name registration all but confirmed the rumors a day before the official announcement. It looked unprofessional and we felt a bit embarrassed. However, spoilers weren't the worst or rarest things to happen to game companies. Fortunately, after the demo and screenshots were released at the ECTS, our fans grasped the scope of our game and projected very positive vibes.

The announcement of the show went well, aside from the faux pas of naming one of our tauren HoofnMouth (tauren characters were especially prone to silly monikers), which was a disease plaguing the UK at the time. (Hoof and mouth disease ravaged the UK in 2001 as millions of cattle, pigs, and sheep were destroyed.) When Mark Kern realized at the show that someone's joke-name might be deeply insulting to our British hosts, he quickly had the character renamed, and the incident went unmentioned by the press.

Mark emailed the team from the ECTS and described the project's worldwide announcement:

> Hello from the not-so-sunny UK! I'm sitting at a public access terminal just before the second day of the show.
>
> ECTS is going amazingly! Although we nearly had a heart attack when we found out about the leak. John [Cash], Chris [Metzen], Sandy, and I were out at a pub, knocking back a few English beers and rapping about how awesome we felt the first day of the show would be. We stumbled back to the hotel around midnight and sat down at this terminal and surfed for the forum post about the third [Blizzard web teaser] picture. Much to our surprise, the forums had stopped! Checking a few other sites, our beer buzz was busted by the news that Blizzard's "secret"

project was now public thanks to an email error! Like Chris says, “we felt like kicked puppies.”

Chris couldn’t watch anymore as we pored over the silly negative posts by the usual suspects and packed it off to bed at 1:00 AM. John and I stayed up for damage control, calling Shane [Dabiri] for the 411 and getting on the phone with Lisa and Melissa to get things sorted out.

It was then that we discovered the build was having problems all day, and Kirk [Mahoney] was up late at night downloading a new one from Blizzard HQ. All this on his birthday too! John and I went up to his room and sat by his neglected birthday cake as we pored over console terminals, urging our lousy Internet connection to stay up and going over contingency plans for tomorrow. We knew the build we shipped was good, and that we were probably merely facing a configuration problem, but to be sure, Kirk downloaded all the tools we would need in case we were wrong. Did I mention Kirk rocked?

Three hours of sleep later, the day of the show arrived, and we all slightly regretted our late round of drinking the night before. Grousing from our lack of sleep, we piled into a taxi and headed over expecting a barrage of questions about the leak and how it happened.

We never got them. It seemed *nobody* knew about the leak. I guess either Europe has some of the crappiest Internet connections in the world, or nobody at the show had any time to really surf the web and figure out what was going on. In fact, the only ones who knew were Brad McQuaid and John Smedley…who had spotted John [Cash] and I and had begun nosing around the booth. “Can you show us?” they asked repeatedly? “Me programmer,” John replied, “know nothing…can’t authorize nothin.”

Well, it was time for the press conference and we piled into a small theater with a projection screen and PA system. The heat was astounding, and everyone was dripping with sweat under the house lights and excitement. We were nervous as hell! The crowd outside was building, threatening to push the doors in—where the hell did all these people come from? The doors opened and people began to trickle in. We had to check their names against the special “press” list but it was obvious the situation was becoming hopeless. There were simply far too many! So Lisa said fuck it and we let the whole throng crash in, packing us up against the walls where we endured through the whole process.

Bill [Roper] went through the prelims, showed the trailer (too dark), then the PowerPoint slides, then the gameplay trailer (too dark), and then a very short, 3 or 4 question Q&A. The audience was silent, no applause, and the questions were lame. To my inexperienced eye…we flopped…

But I was SO wrong! As soon as the conference ended, we were barraged by the press. I had to fight my way back to the booth, dodging reporters along the way. People were hungry for more! Bill did his duty and remained behind to create a diversion while the rest hightailed it

back to the booth. I got cornered by a sleazy Russian web dude and could not avoid having him snap a picture of the "Producer, yes? Take picture. Yes…take picture now." Bill was hopelessly occupied by TV crews and regular press, so it was up to the rest of us to do the demos. We fired up the machines and instantly we were swarmed by the dreaded monsters known as "appointments."

There was no time to think. We charged through the demo and kept running out of time, only getting through a fourth or a third of what we showed CGW. Later, we got into the groove and between learning a new, highly abridged version of the demo, and some hyper-speed talking by myself…we managed.

No, wait…we did more than manage…we blew them away! The press thought our graphics were amazing, and everyone said the interface was incredibly simple to use and that they felt they could play the game right now…and boy did they want to! They had so many questions, but we had so little time (20mins) and there was little we could tell them. Everyone was so excited about the game!

The Verant guys (the guys behind Everquest) were outside again… fishing around. "Is Rob here?" they whined. "C'mon, let us see it!" Bill asked us what to do. I fought between "No way, don't show them shit" to "It's just the demo, and we have this weird friendly thing with them." In the end, I told Bill that we would not show them the game, but we agreed to let them have a press CD or two, knowing that they would find a way to get them anyways. Showing them the build would have been bad… they know too much about how to make these games that I feared they would instantly be able to guess how complete we were, and where we were going. Bill did a masterful job of telling them to "go away" without them feeling like they were dissed.

The day was now over…but the show had only begun! We were so tired, but Melissa arranged a wonderful dinner for us at an Italian restaurant across the Tower Bridge (right next door to our hotel). We dined and laughed and talked about press reactions (CGW is giving us 10 pages!). And we finally gave Kirk a decent birthday with some awesome surprise chocolate cake ordered by Melissa.

By the time we left, it was pouring with rain out, and we ran back to the hotel drenched and drained. But it was worth it…

Mark

The team assayed the response to our announcement by combing through forums, compiling posts, and emailing them to each other. Predominantly, fans were receptive to another fantasy MMO. Since *Wacraft III* would be the next title coming from Blizzard, *StarCraft* fans were disappointed the announcement wasn't *StarCraft 2*. The *Starcraft* fans didn't yet know we had contracted Nihilistic Software to develop *StarCraft: Ghost*, a console first-

person shooter based in the *StarCraft* universe. There were two other negative speculations: the pay-per-play model and the release date. The "battle.netizens" were used to free access to games, and some expressed concerns about spending money every month. The *EverQuest* forums never balked at a fee because they were accustomed to subscription service, and since the average EQ player spent twenty-five-plus hours a week playing, it came to less than a dime per hour. Surprisingly, the EQ forums were remarkably positive about their impressions; not only wasn't there a backlash against Blizzard for challenging *EverQuest*'s turf, but the MMO community expressed more enthusiasm and less skepticism than those on Blizzard's own forum, battle.net.

We talked about how many people might buy our game. Some hoped for an outlandish one million subscribers, more than quadruple the number *EverQuest* had ever supported. Mark smiled and shook his head and pointed out we couldn't accommodate that many people because there simply wasn't enough server hardware available to purchase.

Premature conversations sprang up in the forums about sales figures and subscription fees. People pontificated about beta testing and a release date. The producers insisted WoW must be in beta by next year's ECTS and out the door by Christmas 2002. But in face-to-face conversations, people feared it might be more like Christmas 2003 (spoiler alert: it was Christmas 2004). Almost everyone felt at least a little uneasy with the added pressure of meeting expectations. We spent the afternoon crawling the Web for affirmations and emailing our friends—mostly to assure them they'd be on the earliest beta. And that was the best part of the announcement—we could finally talk about what we were working on.

Few gamers remained dubious of Blizzard's commitment after viewing the WoW demo and screenshots. Our game ranked neck-and-neck with *Star Wars Galaxies* (SWG) in polls for the most anticipated MMO games. We were further encouraged by rumors that the SWG development was lagging behind schedule, as we considered them our chief competitor. The farther they slipped, the more time we had to polish our game. The theory of SWG being behind was supported by dissecting the SWG in-game movie, which showed poor frame rate with only a very few screen elements. Sparse deserts and arctic tundras were the tells that Sony Online hadn't produced many art assets. But even if things looked dodgy, we were careful not to underestimate "the Franchise." Besides, competing with other products was healthy. Blizzard veterans reminisced about the Blizzard/Westwood rivalry when Warcraft titles went up against the *Command and Conquer* and *Dune* real-time strategy games. We were pretty sure the Westwood devs disliked us (or at least some of them did) since our success was borne on the wings of polishing genres, not inventing them.

A common reaction from our industry peers was that our approachable interface meant we would make an unchallenging "Care Bear" game.

Ironically, this assumption likely convinced some of our competitors to target only the smaller audience, the core players, by creating games that required lots of skill and patience—greatly narrowing the potential sales of their titles to casual gamers. No one, including our own dev team, guessed our design leads would create difficult raids—not until Onyxia and the Molten Core playtests surfaced years later.

Allen Adham had long maintained it was amateurs who felt compelled to be original. These were the guys trying to impress journalists with novelty and who rarely asked themselves if their new approach was better. For years Blizzard had shrugged off accusations that we never invented anything. We treated games seriously, as a business, not as an opportunity to be avant-garde. One would think more companies would adopt this attitude, but time and again studios made outrageous claims in pursuit of headlines that inevitably painted them into a corner. While others aimed for higher polygon counts to capture magazine covers, we went in the opposite direction: making games that didn't require a beefed-up system to play. This made more business sense since more people owned modest computers.

Economization of features was another successful philosophy. We wouldn't roll features or functionality into our games just to have more bullet points on our game's box. We only implemented features that could be reused for other types of gameplay and avoided dead-end ideas. For examples of bad ideas, I'll describe some of my own pitches (I had a pantload of them) that I regularly emailed to game designer, Eric Dodds. I proposed things likes a PvP bounty system, something similar to an afterschool assassination game where friends drew names and eliminated each other with toy dart guns. I imagined this could be fun in an MMO. Eric pointed out that this system would require new technology for long-term player tracking, and that people could "cheese" the system by staying offline or hiding in dungeons, and that it would incentivize players to remain in no-combat zones or be surrounded by guards or guild mates. It also duplicated the functionality of PvP servers that already tracked how many enemy kills a character earned. Plus, searching wasn't particularly fun.

Another idea of mine was artifacts, which were unique items that gave the world a bit of zest. The concept of artifacts sounded cool, but it was a terrible idea for an MMO. In tabletop role-playing games (such as *Dungeons & Dragons*), unique objects worked because each game was its own instance. If 99.99 percent of a server couldn't access something, then why bother? It wasn't worth sacrificing accessibility for the sake of lore or a cool concept. My pitches for artifacts and PvP bounties were amateurish, dead-end concepts, but they illustrate the type of "unique features" other companies chased after.

The only two WoW features that weren't multipurpose were the fishing mechanics (bobber-clicking) and the talent system's user interface. Even so, the result of fishing tied into achievements, cooking, and eating mechanics,

and talents were a major focus of the player's attention, so it would be unfair to say we didn't justify the engineering time that went into those features.

So we weren't judging *Star Wars Galaxies* solely by its screenshots. We grew dubious of its game design philosophy. Jedi knights (like my artifacts pitch) were supposed to be very rare, and SWG's interviews focused not on combat but on contrived socialization models—which seemed a bizarre priority for the conflict-ridden Star Wars universe. SWG seemed preoccupied with player motivations and community engineering. Instead of providing abstract incentives not to "grief" other players, we simply prevented the ability to do so. If our designers could prevent griefing and minimize reasons to argue, we were laissez-faire about social behavior. Combat was a hard enough nut to crack; socialization would have to take care of itself.

Until the technology was in place, our combat design was just a theory based on assumptions made about other games. Most of our design decisions didn't happen until the tail end of the project simply because it takes so much engineering to make testing meaningful. This is common for games using their own engine. Eric Dodds explained that writing detailed documents wasn't the best way to design if gameplay wasn't nailed down. Documents were based on assumptions that empirical proof would inevitably invalidate. Unforeseen engine or tool limitations and production costs negate even the most carefully laid plans. Still, ideas were compiled and features were prioritized, but nothing was taken for granted until the game was playable. Anyone analyzing our first gameplay movie might realize we were just running around with armor and weapons. We had no answers for specifics about combat. At the time, we guessed that it might be closer to *Diablo* than to *EverQuest*.

We sometimes reworked our content after evaluating how things "felt." After doing the ECTS demonstrations, the producers and game designers reevaluated the size of Azeroth. They felt the cross-continental run was too short since it took about ten minutes to traverse. The designers, producers, and exterior level designers sat down to talk about what could be done. They reached a decision to divide the continent vertically down the center and double its width. Most zones became bigger, and vertical zones like Stranglethorn became gigantic. Scott Hartin and David Ray needed to create new functionality in wowedit for copying and pasting worldchunks of terrain, creatures, textures, and props—code that took weeks to write and debug.

The exterior designers weren't particularly happy at the prospect of reworking the entire continent—they were tired of Azeroth and wanted to move on to new zones. Carlos Guerrero, our producer, would joke about the exterior level designers acting like "whiny little bitches" whenever they had to make changes. Blizzard's development philosophy was iterative in that everyone redid their work until there was no room for improvement. Code and art were reworked, and these efforts usually improved or built upon the earlier versions. Even producers reworked schedules. But landscapes were erased

and work was often lost before anyone else on the team had seen it, regardless of the quality. No one else lost *polished* work, so perhaps Carlos's jest wasn't completely fair; nevertheless, it was still great fun to call them whiny little bitches.

"Phat lewt," May 2001. As the team's server programmer, Joe Rumsey enjoyed the position of doing many "firsts." Among them was being the first person to loot a corpse using "real" code. Image provided courtesy of Blizzard Entertainment, Inc.

September 2001:
Belated Progress with Dungeons

With Team 2's cat out of the bag, Blizzard moved forward on its other projects. *Warcraft III* was settling into place, and the WoW team was testing it twice a week in order to give Team 1 fresh impressions of the multiplayer experience. So far, the gameplay hadn't been focused on the hero unit; people were treating multiplayer games like *StarCraft*-like production races by overwhelming opponents with superior numbers. The prevailing opinion was to limit the number of units to put more emphasis on army composition and battle management. Design improvements like these often happen at the tail end of development, so it was healthy to keep an open mind.

Three more people came on board to WoW. Sam Lantinga joined us as a gameplay programmer to help work on our feature list, which was getting longer instead of shorter. We also got John Mikros to work on our Macintosh code. He had been working with Team 1 since he started six months earlier on their Mac port. Lastly, we added someone we hoped would be our last interior level designer, Aaron Keller. Two conference rooms were cleared out to make

enough room for the five interior designers and four exterior level designers to sit in groups. The team was too big and the foot traffic too busy to put people in the hallway anymore, so all the devs were crammed into offices. This was the first time since WoW's beginnings two years before that our hallways were empty aside from the three producer desks. We had forty-two people not counting the music and sound crew, whose studios were elsewhere in the building.

Some of the Team 2 programmers were optimizing both WoW and *Warcraft III* code to improve frame rate on both games because using 3D models to build the user interface was costing us more processing power than we wanted. The WoW interface ate thirty frames per second (about ten times what it should have cost) and the *Warcraft III* UI wasn't much faster. One of Sam Lantinga's first duties as a programmer would be to rebuild code that supported the UI. Other programmers made engine optimizations, including economizing how vertices were sent to the video card, yielding a 50 percent increase in rendering exterior terrain. Another improvement was a level-of-detail system that enabled us to push the clipping plane back (allowing players to see farther) with only a negligible hit to frame rate. Yet another improvement was made for zones using large numbers of identical doodads. John Cash and Jeff Chow had been working on supporting sounds for both *Warcraft III* and WoW, and finally, spellcasting was now possible for monsters. Ghouls, of course, were our first spellcasting monsters and were especially fond of casting the spell "blizzard" on anyone running nearby.

The animators were getting ahead of the rest of the team and were halfway done with playable characters. Swimming, riding, and climbing animations could not be started until they had design approval and technological support for these actions, so they were taking a desired break to work on monsters. A monster's animations could be done in less than a week and they often had unusual body types, so they were much less repetitive than player characters. There were roughly five months of monster animations left, and the department was looking forward to some variety.

The Forsaken and night elves would be announced when the game got closer to release, because it was possible that one of them could get another makeover. There was much debate on how "skeletal" the Forsaken should be. As with other races, we wanted the undead to be somewhat sympathetic. The discussion prompted Chris to confront the team about the confusion we were having. He told us to stop calling the undead player race "the Scourge." He explained that the Scourge and the Forsaken weren't the same thing. The difference was that the mindless Scourge were controlled by the Lich King, while the Forsaken were the recently plagued humans. Since the team hadn't played *Warcraft III*'s single-player levels yet, this distinction between the Forsaken and the Scourge didn't resonate, so we persisted in calling the undead the wrong name.

The first screenshot of a textured 3D Studio Max dungeon, September 2001. Dana Jan's character (wearing the new Stormwind Guard armor set) stands in a goldmine used to test how expensive collision is with the game's frame rate. As it turned out, the user interface (before optimization) was costing thirty frames per second, while the goldmine geometry cost only five! Image provided courtesy of Blizzard Entertainment, Inc.

The dungeons had made some major strides. The switch to using 3D Studio Max was a crucially correct decision, and the interior level designers were comfortable with the new tool. As 3D Studio Max was the same editor the artists used to make doodads, players, and monsters, it was easier for the programmers (already familiar with 3D Studio Max) to integrate dungeon geometry into the game. Tim Truesdale finished the lightmap code (which added shadows) and Scott Hartin was in the process of integrating dungeon geometry into both the game engine and wowedit. Once he was done we could begin testing buildings in-game. Wowedit would eventually allow us to punch holes into the ground so we could insert underground caves and dungeons. Once the basic support for dungeons was implemented in wowedit, David Ray took over the task of making the process easier for exterior level designers to place dungeons into the world. Seeing interiors in-game was a morale boost for the level designers because it unified their work with the rest of the team. Up until this point the people building and painting textures for dungeons didn't feel like they were pushing the project forward. Another advance in dungeons was making them stream (which meant sending content to the engine in tiny bits instead of loading everything at once). With the

interiors streaming, the entire game could load on the fly, which was a major milestone because it alleviated the worry of loading screens wherever there was lots of architecture.

Since dungeons weren't part of the ECTS announcement, the plan was to show off interiors at the next E3. Hopefully we'd resist the temptation to release screenshots before then. Collin Murray hadn't finished collision for interiors, so we could only walk around in them as long as we didn't touch any walls (which would cause the game to crash). The switch from creating geometry through Radiant to 3D Studio Max made collision detection harder. We didn't know how many different planes could be checked by multiple players and what the effect would be on overall performance. Frame rate wasn't determined by rendering alone, so sometimes calculations such as collision detection could slow things down. So we ran collision tests on the interiors and determined that a party of three people and a dozen monsters got about 20–50 frames per second (fps). That was good because anything over thirty was acceptable for a massively multiplayer game, so these tests reassured us we were not creating geometry too expensive for the processors to render. We were surprised to learn our player models were costing too much frame rate, almost one fps per player. This may not sound like a lot, but in cities or in forty-player raids, the cost would add up. Shortcuts were made in the animation to compensate, and we hoped we wouldn't have to take out the character's individual finger bones because that would involve reworking many player animations.

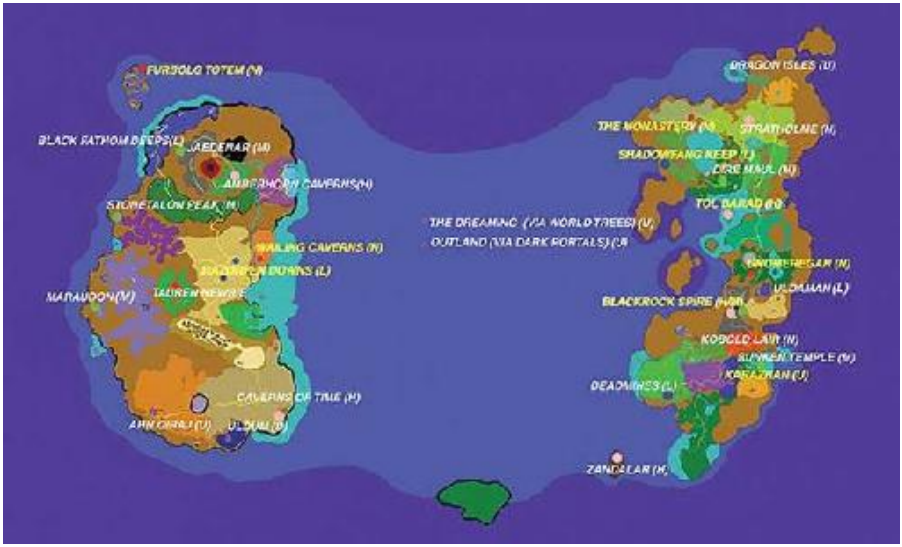
October 2001: Learning from the Good and Bad

To prevent stagnation and complacency from creeping into the atmosphere, the team met once a month to keep everyone moving in the same direction, highlight each other's progress, and disseminate new ideas. At one such gathering, Gary Platner announced he was hoping to be finished with all the world textures for the exteriors by the end of the year. The exterior level designers were finally pushing into Kalimdor, which meant they were farther along than everyone else on the team, and would be in a position to help polish other aspects of the project if the exterior zones were finished early. Monsters would also be finished in several months, so three more playable races were added to the game—trolls, gnomes, and goblins—all of which were already NPCs.

At the meeting, Allen Adham announced a resolution for the subject of good/evil races playing together. He thought the concept of "us and them" reinforced a sense of community and camaraderie, and by prohibiting orcs and humans to group or communicate within the world, the races inherited more personality. This philosophy was directly influenced by his experience in playing *Dark Age of Camelot,* whose PvP system relegated "ganking" (attacking vulnerable players) to a specific zone, and Allen thought it an elegant system. He wanted our realm-versus-realm conflict to be confined to specific zones, so ganking would be consensual and off-limits in starting areas. Dividing the player base into two groups would also alleviate our fear of communities feeling so big that no one recognized one another. Players seeing familiar names reinforced a sense of friendliness and camaraderie, something Allen had noticed when playing both *Anarchy Online* and *Dark Age of Camelot*. It was fun recognizing enemies by their silhouettes, and the spontaneity of enemy player collision added variation to the world. In the meeting, Allen also discussed the five schools of magic and how magic resistance would apply to items. One of the biggest problems in persistent games is "power creep," which is the escalation of item stats that could render overachievers too powerful. Schools of magic promised "sidegrades" that could reward players for progressing through raid content without inflating their gear too much.

WoW development had slowed down for two reasons. First, we were busy helping Team 1 polish *Warcraft III*. Artists and our designers were playtesting two days a week, while the Team 2 programmers offered engineering support, optimizing the UI performance for both projects. We held weekly meetings with the Team 1 game designers and discussed various issues with *Warcraft III*, such as whether or not people liked NPC monsters called "creeps" or the limits to army size called "food tax," and we talked about

which units felt over- or underpowered.



Dungeon Plan, October 2001. Derek Simmons maintained an intranet webpage depicting the overall map. The world constantly changed: Dungeons were moved, and zones were enlarged, shrunk, reshaped, and deleted every month. Intranet maps were always inaccurate. Still, it was encouraging and sometimes helpful to see the world design, even if it was out of date. Image provided courtesy of Blizzard Entertainment, Inc.

The second reason development had slowed was the release of *Dark Age of Camelot* (DAoC) by Vivendi Games. Unlike *Anarchy Online*, people were playing DAoC for longer than a month because it was loads of fun—not just because we wanted to study it (our game designers played *every* MMO available because even the worst ones had interesting ideas). Designers and MMO junkies on the team discussed what they liked and disliked about DAoC. It was common for us to pick apart game mechanics and analyze why we loved or hated certain features. If something didn't work we gave suggestions on how to improve things.

The designers were in day-long meetings with producers and programmers to go over the major undertaking of designing a tool for making quests. Although grueling, six-hour meetings were necessary before a system could be written, if we couldn't accurately predict how we wanted the quest tools to work, it could slow down implementation of quests (as well as costing precious tool time). What made the whole endeavor so difficult were the hundreds of variables contributing to every quest. If these components weren't optimally organized in the interface, it could create lots of repetitive work for anyone implementing quests. So tool discussions were meticulous, and decisions were reached under heavy scrutiny.

The game designers had abandoned the "generic dungeon" approach that proposed creating 3D dungeon tile sets to make dungeons randomized experiences. One deciding factor was that too many dungeons might divide the player base in what was supposed to be a social game. A total of thirty dungeons had been agreed upon. Chris Metzen and Derek Simmons explained that each dungeon would have its own feel. For instance, Shadowfang Keep, the Scourge newbie dungeon (we were still calling the player race the Scourge instead of the Forsaken), was supposed to feel like the archetypal haunted castle, while the tauren newbie dungeon was to have a Wild West flavor (this tauren dungeon was ultimately canceled, since there was so much content in the Barrens already).

After the programmers enabled us to place our dungeons into the world, we discovered another obstacle in our production pipeline: We couldn't easily place doodads inside them. Because Dana Jan was the first to realize this after his goldmine was placed in Elwynn, he became the guinea pig for many new processes—like placing props. This wasn't a fun job. When Dana described how hard it was to place objects in interiors using wowedit, the producers pushed back because they didn't like what they were hearing (it meant another major tool request). The reason wowedit wasn't great for placing props inside dungeons was because it couldn't distinguish between the floors, walls, and ceilings. The result was that the prop tool (meant for exterior terrain) accidentally placed objects on dungeon ceilings. Furthermore, if a dungeon ever needed to be moved, it would require hours and possibly days of adjusting all the props individually since there was no group-selection functionality. This was especially dangerous because some rooms had hundreds of individually placed objects, such as rocks or bones, and an entire dungeon could have thousands of props (including bones, chairs, lamps, or spiderwebs).

David Ray explained it would be a major undertaking to engineer a tool that placed doodads for dungeons, because wowedit fundamentally didn't move objects the same way as 3D Studio Max did. The producers couldn't add another tool to David's task list because combat testing was waiting for his spell editor, which would take months of work, so they begged the unhappy dungeon group to adapt to the existing tool (spoiler alert: we didn't). The resolution left the interior department upset, the tools programmer unappreciated, and the producers feeling guilty. A few days later, programmers Collin Murray and Tim Truesdale, who were more familiar with 3D Studio Max, worked with Dana to create a plug-in that allowed dungeon designers to import and place doodads in the 3D Studio Max dungeon file, which ended the production crisis.

Interdepartmental Assistance

From time to time the team's art director, Bill Petras, painted covers for

Blizzard novels, ads, or merchandise that involved an iconic scene. His box cover artwork for *Warcraft III* looked great but felt a little dated and too much like the old Warcraft packaging. It was decided that a high-resolution rendering would look newer, and no one could pull that off as well as the cinematics department. Helping them would be our own artist, Justin Thavirat. He, like many Blizzard artists, was accustomed to a very painterly style, so high-resolution rendering was a new approach. As it turned out, Team 2 lost Justin to Team 1 for four different box covers and a fifth for *Warcraft III*'s expansion, *The Frozen Throne*.

Justin's year-long absence was a loss we hadn't planned for, yet there were new recruits bolstering our ranks. The team got three new members: our fifth and final animator, Adam Byrne, would be starting in November, and two "texture welders" who were promoted from the QA department to aid in the tedious application of textures to dungeon geometry. Matt Mocarski was the only texture artist supporting the five interior level designers and he was bogged down in applying all his textures to geometry, so Jamin Shoulet and Roger Eberhart were added to the dungeon team to help out. Roger already had his five-year sword (an award the company gives for long-term service) from his time in QA, so he was very glad to finally be a part of a development team. He'd received his sword at the annual company award ceremony along with other Team 2 honorees, including Justin Thavirat and Dan Moore. More additions would be made to Team 2 in November, including Roman Kenney, a Team 1 veteran who would help with WoW's character and world design. He started working on finished monsters and repainting texture variations, giving them different colors or skin patterns. Roman had his ten-year shield and had worked on nearly every project the company had shipped, bouncing around wherever he was needed. He was especially eager to work on WoW since he was an extreme *EverQuest* junkie. He would fall asleep at his desk with headphones on at night to "camp" rare monster spawns, waking up only after hearing monsters attack him. My favorite EQ story involved Roman asleep while his character ran in wide circles, aggroing (provoking) every monster around, who chased him while he dozed. Pete Underwood, a five-year veteran whose duties included producing game manuals, was coming aboard to help us with cleanup work to relieve the artists of some of their technical duties, giving producers some peace of mind knowing that someone was proofreading everyone's work. Such work included adding collision geometry, welding vertices, standardizing settings, and optimizing textures. He also helped cut up textures to accommodate player customization. Back in the office was our rarely seen musician, Jason Hayes. For a short while, he was with us on a daily basis to work on the zone music.

The team count by November was forty-eight people. In just my year on the project, we'd hired twenty-eight other developers and grew beyond our expected team size by twenty percent.

For both continents, the arrangement of zones was determined by their level of difficulty, color palette, lore, and locational convenience. Some proper names didn't get finalized until the very end of the project, which caused a measure of confusion for the team, who were accustomed to generic names such as "the undead newbie zone." We called places like Scholomance "the keep microdungeon" for the longest time. The number of zones was determined by the game designers, who were guessing as to how much content they needed in the game. Chris Metzen and the art team only vaguely knew the level ranges, which were finalized only in the last year of development. Only then did game designers realize how fast they wanted players to reach the max level and begin raiding endgame content.

In this fluid state of indecision, even major lore objects like the Dark Portal bounced around. Chris decided to move it out of the Tree of Life area (no one on the team called it Teldrassil), letting "the World Tree" become its own area. He planned to move the Dark Portal to Azshara because the game designers were thinking of making it a high-level area anyway, and it was also cool to have the Dark Portal submerged in water. Eventually Chris decided on putting it in the Blasted Lands because there really wasn't anything else interesting going on there.

Many of the zone ideas didn't even come from Chris. While Bill Petras painted zone color studies, he also spent most of his day interacting with every member of the art team. His office was next to mine and he would sometimes joke that he hadn't been in his seat all day, and that the first time he checked his email was during dinner. To keep the art team on the same page, Bill's daily routine included going from desk to desk, asking people to show him what they were working on. He asked if everything was going well or if there were any bottlenecks in their process or if they needed tools. As the team grew, he wasn't able to make it to everyone's desk every day—even when the days were long—so he'd chat with every artist every two or three days. This afforded him a firsthand perspective on production and art issues. If artists were complaining about something taking too long to resolve, they'd show him. He didn't just know about bottlenecks, he *understood* them enough to know how much they affected the workflow. He knew the difference between a roadblock in the animation department versus one in the interiors department (dungeons) and could prioritize a fix for the more pressing issue. If a concept artist was ahead on their task list, he could immediately reassign them to a more vital asset. He knew everyone's strengths and weaknesses, and everyone beneath him felt connected to top-level decision-making.

In the course of his rounds, Bill sometimes asked for ideas about non-archetypal zones, which didn't play a part in Warcraft's larger storyline. "What's an idea for a zone? What haven't we done yet?" I usually had

suggestions ready, and one such immediate reply was, “A tide pool zone.” Bill was amazed by how fast I “came up with” an idea and said, “Hmm. Good! We haven’t done that yet.” He hopped on his computer and searched for tide pool photo references, and that’s how Azshara started. Many months later exterior level designer Alen Lapidis built the area.

The only other pitch of mine that made it into the game was the Blasted Lands. My family had once visited Greater Sudbury, Canada, a mining town whose soil was made nickel-rich by a meteor strike long ago. Sudbury’s surroundings were desolate, and the rocks in its landscape had been discolored by acid rain. As a child, I misunderstood that the blackened rocks were from the meteorite, but the idea of a wasteland scorched by a meteor had made an impression on me, so I pitched the idea to Bill. He didn’t quite like the idea of black everywhere, wanting to stay with a colorful palette, but Sudbury’s discoloration worked with the Dark Portal. At the tail end of the project, artist Matt Milizia later came up with a way to pull off lightning strikes that gave the zone even more character.

If everyone liked a new zone idea, the artists began sketching concepts for its art assets, such as buildings, trees, and rocks. Gary Platner would then capture the feel of Bill’s color study by creating an in-game demo area for the exterior level designers to follow when they built the zone. Gary would also create the ground textures and some of the props, but often started with trees made by Brian Hsu or Justin Thavirat. Dan Moore created additional doodads (as the team’s earliest member, he had possibly created more art assets than anyone else). Until Gary had a demo area with which both he and Bill were happy, none of the exterior level designers would begin working.

The exterior designers could press forward on a zone even without art assets. They sprayed on the ground words such as “player-hub” and used placeholder buildings to scale distances, establishing basic elevations and overall proportions. A surprising number of problems (such as choke points and empty areas) were identified early with this kind of prototyping. Knowing and shaping gameplay (in terms of run distances, connectivity, and traffic distribution) was what set level designers apart from the rest of the art team. After art and level designers were done with a zone, world designers populated it with spawns, game designers created its loot tables, and lastly, quest designers scripted it with quests.

Blasted Lands, color study by Bill Petras (left), and final Dark Portal placement, textures by Gary Platner (right); zone design by Mark Downie and Matt Sanders. Images provided courtesy of Blizzard Entertainment, Inc.

Exteriors were created through this long, collaborative production pipeline. After an idea for a zone was approved by Chris Metzen, it would fall to Bill's color study to represent the general feel of the area so that artists and exterior level designers would be working in the same direction. Zone influences came from everywhere. Justin Thavirat (who specialized in low polygon trees) said the purple night elf trees in Teldrassil (my favorite zone) were inspired by the purple Jacaranda trees lining Campus Drive, a street near the Blizzard office. Westfall was inspired by the Oklahoma dust bowl, and Duskwood came straight from *The Legend of Sleepy Hollow*. The Barrens, however, was not the team's favorite zone—even Matt Sanders, the fastidious exterior level designer who worked on it, didn't care for the idea of an empty zone.

Color study and 3D sketch by Bill Petras and Gary Platner, September 2001. Translating these into the 3D world had become Gary's primary role. With only four textures per zone (any more would cause the engine to slow), Gary's goal wasn't just to make it look like the color study but to make textures work together; they needed to be in the same color range, provide contrasting values of light/dark, and not be too busy. His demo for the Badlands used a new stipple technique, but he didn't know if it would take too much time to do since level designers were typically given only six weeks for a zone. Images provided courtesy of Blizzard Entertainment, Inc.

Searing Gorge assets by John Staats, with zone design by Mark Downie. My favorite “ninja” (an unapproved task) was replacing the structures in the Searing Gorge. Mark had filled the zone with orc watchtowers (even though they were populated with dark iron dwarves), scaffolds made from the Booty Bay docks, and mountain caves whose rocks were a cool shade of blue. There wasn’t any time on the schedule to create a zone-wide set of buildings and props, so the placeholders remained until the tail end of the project. These original wooden structures were a garish yellow, belonged to the wrong race, and were flammable, which made no sense in a volcanic zone. I spent a few weekends applying Brian Morrisroe’s excellent dark iron dwarf textures to create something more fitting (pictured). Image provided courtesy of Blizzard Entertainment, Inc.

Exterior level designers were ever-hungry for new art assets to flesh out their zones. They’d only get exactly four terrain textures and about a dozen unique doodads. Because their ideas were limited by what props existed, they needed to be creative with what they had. They even got jealous when other zones got more unique assets. The only thing worse than overused assets was a lack of them, so they were forced to use placeholders. The more inappropriate the placeholder, the more likely that someone from the art team would create an art task to replace it with something that wouldn’t stick out like a sore thumb. Part of their job was remembering which assets were temporary, and often months went by before they could replace them with new versions. Each wanted closure and rejoiced when ersatz versions were swapped with finished replacements. It was a haphazard process but it worked.

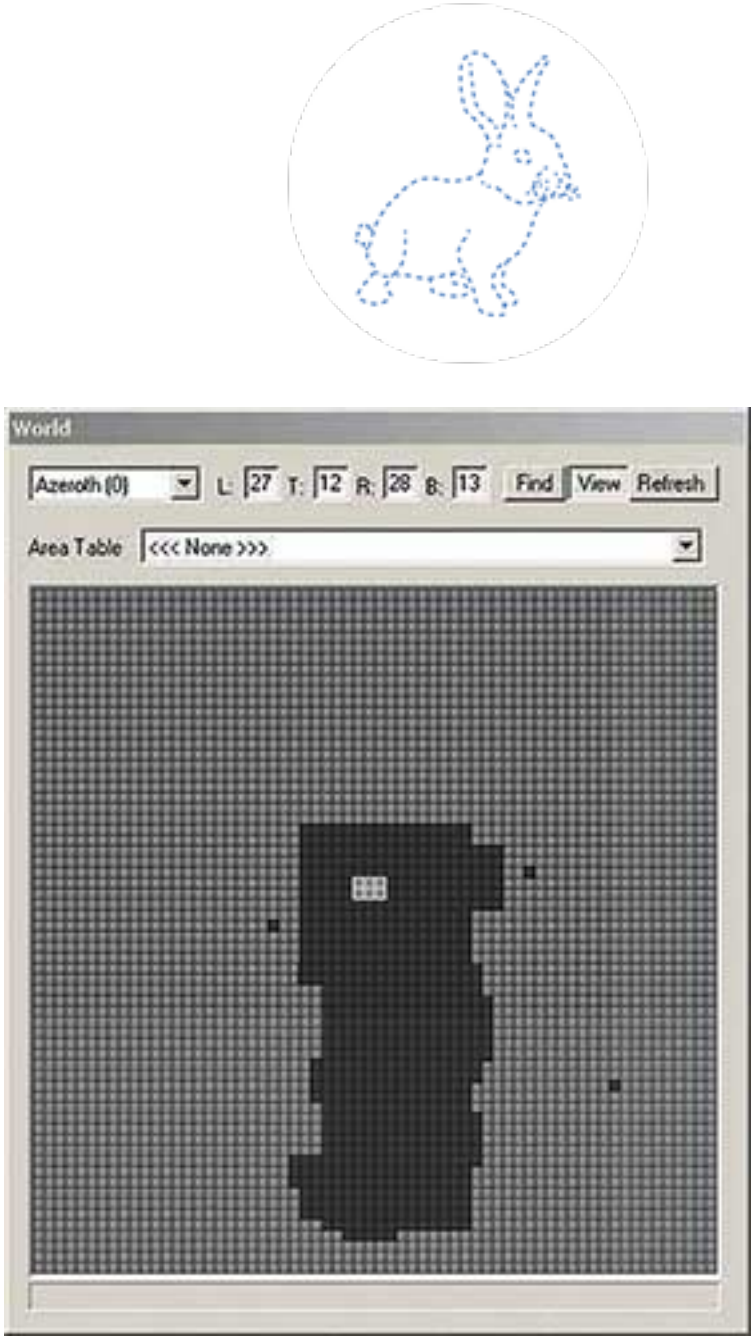
By spraying down textures and placing props, trees, and buildings, the exterior level designers “imagined” villages and places into existence. Projecting oneself into the environment was the fastest way to come up with new ideas on how to create believable areas, each with sensible paths and points of interest. Each zone “belonged” to an exterior designer, who was its

fiercely protective gatekeeper until it was ready to be turned over to the spawners (who placed the monsters) and quest designers (who placed the NPCs). Until that time, the level designers did their best to avoid stepping on one another's toes.

As noted before, each zone had only four textures, and the use of these textures went beyond simply using dirt for paths or grass for hills. Effort was made to camouflage patterns by irregularly mixing textures and breaking up wide areas with artful irregularities in the terrain. Exterior level designers developed an eye for sculpting terrain, capturing how erosion affected topography. They created "scenes" where players could enjoy unimpeded beauty shots of a location. In addition to their artistic eye, the exterior team built areas for gameplay. They ran around a newly created zone to see how busy or empty it felt. They measured how much time it took to run between points of interest and compared it to the zone concepts and decided how civilized or unsettled the area should be.

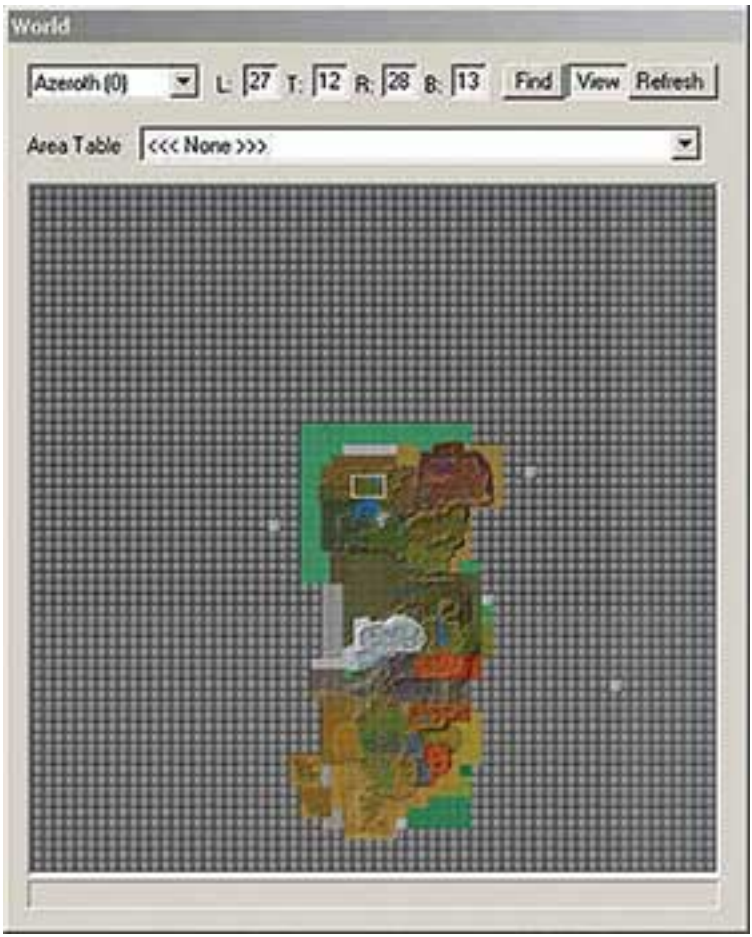
Without a department lead, the exterior team learned to critique one another's techniques and touched up each other's work. They kept an eye on one another's progress to see if anyone had discovered how to repurpose a prop, such as shoving a tree into the ground to create a bush. If there was an art asset they really wanted, art requests were made to a producer, selling their idea as best they could. The producer would then decide to add it to the art task list or, more often than not, reject the idea and say, "Sorry, you gotta use what you have already." On very rare occasions, they would sneak over to an artist and directly ask them to ninja something into the game. They were respectful of not bloating artists' task list and were judicious with these requests, and producers sometimes turned a blind eye if the new assets could be created quickly or if the artist agreed to make them on their own time.

After the exterior designers finished their zone, the next step in the production pipeline was handing it off to the spawners and world designers, whose tasks were so disparate it was difficult to give them a more specific title. Josh Kurtz was our first world designer and had transitioned from the exterior level design team (he did the first pass of Elwynn back in the day). Josh was an MMO aficionado who had worked with the programmers on prototyping tools and features such as our travel systems (boats and taxis, for example), instance teleport-triggers, spawning, naming, and writing NPC text. He even helped the art team accurately knit together zone maps. He knew everything about the game, and was often David Ray's go-to person for prototyping new features or tools.

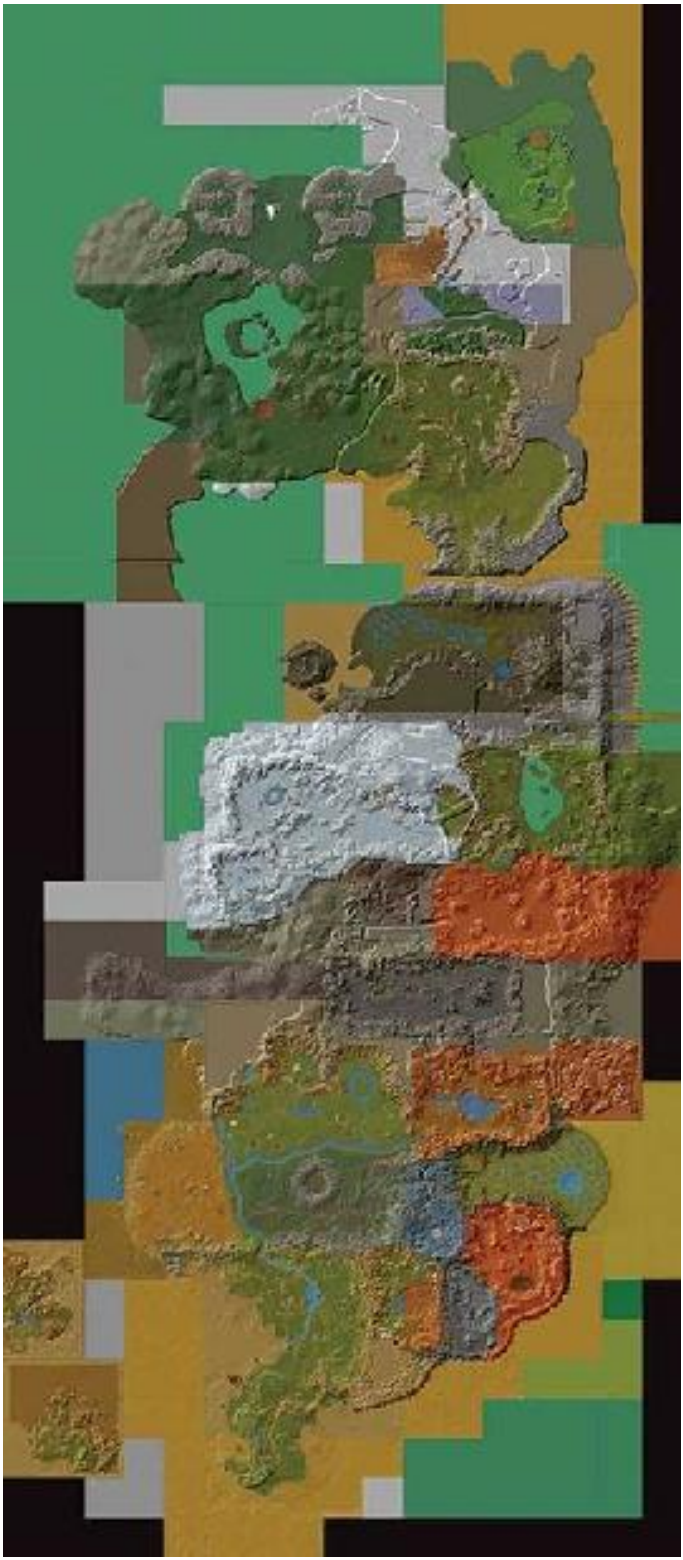


Azeroth in wowedit's check-out window, September 2001. The continent of Azeroth (left) was divided into a grid whose units were called worldchunks. Exterior level designers and spawners checked out worldchunks so other developers couldn't inadvertently work on the same parts of the world at the same time. They selected which cells they needed and checked them out (as shown by the six selected Lordaeron cells to the left).

The exterior level designers began creating terrain in the human starting areas and radiated outward. Several times the parameters of the continent were resized, which required painful and fastidious reworking. Images provided courtesy of Blizzard Entertainment, Inc.



Azeroth in wowedit's check-out window, June 2003. The check-out window became much easier to use after David Ray wrote a program he called Mapstitcher, which used the world shadows and terrain textures to better indicate topography. An unplanned byproduct of this functionality enabled the rendering of satellite images (each continent took four or five hours to render).



A satellite view of Azeroth and Lordaeron, September 2002. Mapstitcher provided the only accurate visualization of the continent and helped with the decision to widen Azeroth after we had announced the game at the ECTS. Tim Truesdale set up a separate machine to render the entire continent at once. Tim also taught Mapstitcher to render dungeon geometry so cities and buildings would appear, using the images as a source for mini-maps.

November 2001: Client–Server Headaches

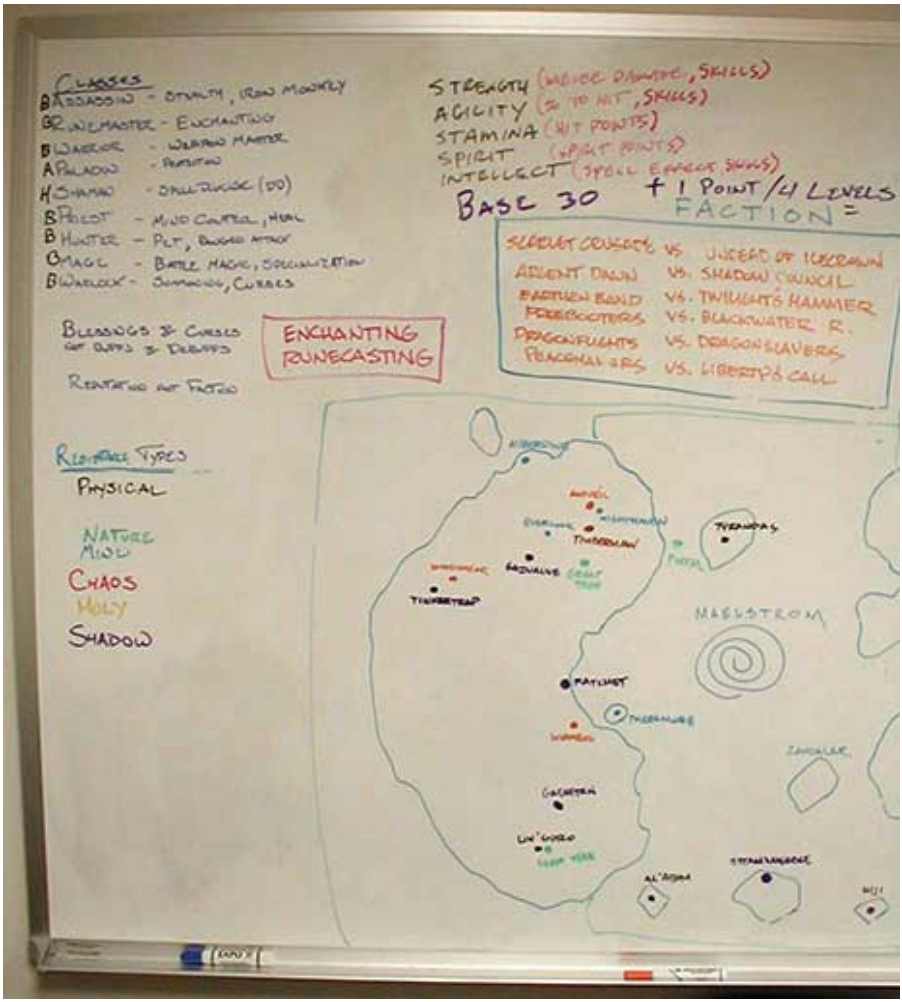
Kyle Harrison is an animator and technical artist who loved to work with anything new. He spent a few days researching procedural ocean textures, playing around with plug-ins that generated wave patterns. He even found one that was used in movies, and Tim Truesdale was helping him integrate the test technology into the game. Teammates gathered around to see the result, and their first impressions were very positive. Procedural water meant designers could create or modify water without making art requests. Procedural visuals endowed designers with a higher degree of control, so things like transitions were possible (for example, a river might empty directly into an ocean, or a lake's color could change on opposing shores). There was no plan yet as to how oceans would integrate with river water, and we didn't know whether procedural water was inexpensive enough to run in-game. Some people wanted procedural 3D waves, but the lag time between client and server would confuse the engine because the dynamic surface prevented the player's camera from determining whether a creature should be above or below the surface. Waves would be too expensive to accurately track whether the player was in the trough or the crest. Ultimately there were too many engine issues, so procedural water never happened—transitions between rivers were hidden by waterfalls, which, luckily, turned out to be quite picturesque.

"The world server is down!" was a common cry from the interior level design room in November. Five of us worked side by side in one of the converted conference rooms, so few things happened that the rest of the dungeon group didn't know about. We couldn't see our work in-game if one of the servers was having a problem, and at this stage of development, the server had been down for weeks, so the whole dungeon team was "building blind." The dungeon server was out of order because its architecture was being written to support multiple instances. As far as interiors went, there were still only a couple of "buildings" in the game. Dana Jan's goldmine newbie dungeon, called the Deadmines, was the only show of progress. Dana also had a couple of goldmines in Elwynn, and Aaron Keller had a couple of buildings, such as an inn and a farmhouse. We carefully considered transitions between interior and exterior spaces to see how big buildings needed to be. There was only one texture artist for the dungeon team, so our department's output was slow. Matt Mocarski had a backlog of 3D models that needed texturing. Team 1 artists had tried helping Matt, since *Warcraft III* was on schedule, but texturing for interior architecture proved to be too dissimilar from their area of expertise.

We couldn't place Dana's Deadmines into the world yet because we lacked the ability to punch holes in the terrain (to allow for underground rooms). Dana was using several building methods to "hide" geometry to optimize frame rate. He and Scott had been testing culling methods since April in an effort to maintain a smooth frame rate, but they still didn't have anything locked down.

Procedural water test by Tim Truesdale and Kyle Harrison, November 2001. Tim emailed the team in case anyone hadn't seen it on his screen. Several times ten or so people crammed into Tim's office to gawk at the oceans. Because they're procedural, and not art, they could be changed on the fly, with water color and wave size seamlessly transitioning between different areas, or they could vary depending on weather conditions.

One thing we'd learned about interiors was that the in-game camera wasn't working as smoothly as the game designers would have liked. We were worried that excess camera movement would disorient the player. The camera collided with the walls and ceilings, and when the player camera slid behind a wall-hanging, the on-screen view was obscured by the back of the picture! This was especially noticeable in the inn, which was one of the two interiors. The camera might be reworked, or we might have to build things another way. It was still too early to know.



Design whiteboard, November 2001. Every few weeks something new went up on the two whiteboards in the game designer's office. Issues listed from left to right were: player classes, spell types, player attributes, race alliances, site maps, and faction notes. I visited their office daily and nagged them about design issues such as ladders, monster scripts, or dungeon size. (Note the first two classes listed and the absence of druids.) Photo by John Staats. Image provided courtesy of Blizzard Entertainment, Inc.

December 2001: Holiday Quietude

Development was slowing because many team members hailed from different parts of the country and were gone during holidays to visit friends and family. With the holidays come holiday movies, and *The Lord of the Rings: The Fellowship of the Ring* was a special event. The team often went en masse to movies, and sometimes the company booked the whole theater so we didn't waste more time waiting in lines on opening day. Blizzard often bought tickets for the must-see movies. *X-Men, Final Fantasy, Tomb Raider, Planet of the Apes, Dungeons & Dragons, Harry Potter,* and *The Fellowship of the Ring* were all such films. On December 19, we saw Peter Jackson's first *Lord of the Rings* movie, and it blew us away. After the noon showing, a day-long discussion followed. A film like *Fellowship* really hit home, so a lot of people were too excited to get much work done, which was on par for a typical Friday in late December.

We were still holding team meetings to keep everyone informed of our collective progress. Major progress was announced with the interface by implementing collapsible UI elements. The new unobtrusive interface pushed the chat area to the side, reducing the need for a chat box overlay. The mini-map, player icons, and group information were also minimized to offer a clean window into our world.

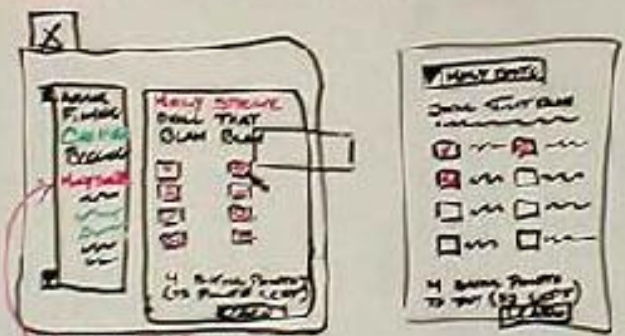
The meeting highlights included updates from strike teams (which were composed of several personnel working on different projects). They were a cross-pollination that borrowed fresh, unbiased opinions from other developers to evaluate a project's progress and decisions. The devs on WoW, who were strike team members of other Blizzard games, let us know how things were going elsewhere in the company, but more often than not, these reports were lackluster and vague. It seemed as if the most critical reviews weren't publicly voiced, which sometimes left little to say for anyone explaining why some projects weren't showing progress.

ALLEN TOPICS

FRIENDS DON'T DESIGN DO

- COMBAT DYNAMIC EVALUATION
  - ATTACK SPEEDS
  - COMBAT FORMULAE
- ATTRIBUTES
- HOW DO YOU GET SKILLS
- FALLING DAMAGE
- W/I FOR SOFTLOCK, MOUSEOVER, BUFFS
- SOUND DISCUSSION (PRODUCERS)
- GENDER BASED ABILITIES
- LADDERS?
- DEFAULT CAMERA ANGLE
- COPYING SPELLS TO SPELLBOOK

- MONSTERS HAVE ATTRIBUTES?



- CURRENT SELECTION
- GREY OUT SKILLS YOU ALREADY HAVE

BUYING / TRAINING IN NEW ABILITIES/SPELLS USES MERCHANT INTERFACE.

Allen Topics, December 2001. Major design topics didn't get decided until Allen Adham weighed in. Eric Dodds and Kevin Jordan's office was dominated by two whiteboards filled with notes on the game, and the "Allen list" covered the most pressing issues to discuss. Kevin drew smiley faces next to resolved propositions and unhappy faces next to unpopular issues, such as gender-based attributes. Listed topics were combat, attributes, skill acquisition, falling damage, user interface for buffs, sounds, genders, ladders, camera, spell book interface, monster attributes, and training/buying interface. When issues were resolved, the result would be explained to the producers, who prioritized features into the programming schedule. Image provided courtesy of Blizzard Entertainment, Inc.

Too often I hear, "A game just needs a great idea to be successful." Aside from being an obvious oversimplification of the development process, there's the implication that good ideas are either rare or crucial. In my experience, good ideas in game companies are common. The problem is ideas take a long time to implement, and the road to realization is shaped by detours, discoveries, and problem-solving. Good MMO designers pursue ideas that establish fertile groundwork for content creation, not gimmicks or twists that set their game apart. Solid gameplay comes from hundreds of tiny decisions, few of them noteworthy enough to print on an ad or the packaging's bullet points. Can you imagine if Blizzard printed on the back of the WoW box features like "Trade Confirmation Buttons!" or "No-Drop Rares!" or "Perfect Success Rate for Item Creation!" And yet these were the details that kept WoW fun, by preventing griefing behavior, stabilizing the game economy, and fulfilling promised rewards.

If we ignore the fact that many industry decisions come from the insistence of marketing or publishing executives, and if we pare away all the moving parts, problems, and baggage associated with actually producing a game, we are left with what the designers are trying to accomplish. Unfortunately, this mental exercise is never the case even in ideal situations—but for our purposes, let's pretend gameplay designers have total control over their game: Without the interference of outside forces such as production or engine limits, we can address what makes games fun.

Game designers should build from solid moment-to-moment gameplay, discovering where it leads them, instead of working backwards and forcing their vision to happen. The wrong approach is starting with a cool concept like "vehicles" and shoe-horning them into a game. *Battlefield 1942* showed that voluntary vehicles could be fun. *Requiring* players to use them felt like the game was taking away their abilities. While WoW rarely made missteps like this, other MMO games based their core gameplay around forced concepts (like complex social systems, neighborhoods, or sieges), which weren't arrived at organically, and only *sounded* fun.

When conceptualizing game ideas, inexperienced designers usually predict (and hang on to) grand schemes of interrelated game systems before establishing whether they present players with enjoyable engagement. The journey must be as satisfying as the end result. Good designers cut away features and ideas that don't offer players compelling decisions, don't create flexible gameplay, or add too many rules. Gameplay features must deliver a lot of bang for the buck, which means they should be malleable and fertile for a variety of experiences. Some ideas branch naturally, while others are dead ends. By pruning away these dead-end ideas, the seasoned designer subtracts from (rather than adding to) their vision. What they're left with is an elegant

system whose only aspects of gameplay are flexible and long-lasting. Blizzard games excel in cutting off the fat to reach a state of "concentrated coolness," and WoW was no exception.

In WoW's case, the core gameplay is "players improving their character by acquiring better gear." This concept is a solid (albeit common) foundation to build upon. Of course, there wasn't a formal meeting on where to start our gameplay; the entire company knew role-playing games, so no one needed to declare all that gameplay would dovetail into the core concept of acquiring better equipment. Since gearing-up characters is fun, the big question involved asking how many ways gear can be acquired. The answer came from common RPG tropes: equipment is obtained from *killing monsters, completing quests*, and *crafting items*—and all WoW gameplay derives from these three branches. Again, this was no great leap of imagination, and there was no shame in building on established ideas. The key was making each branch fun. Instead of trying to come up with innovations, all efforts were focused on ironing out glitches and hitches associated with the big three: combat, quests, and crafting.

With the larger questions answered before the game was even started, the programmers and artists had to build enough features and art assets for the designers to begin testing all the devils in the details—which, unfortunately, was performed near the tail end of the development cycle. The paradox was that artists, producers, and programmers tried to support gameplay before it actually existed. This meant the entire development was crunching long hours based on educated guesswork. If the designers' ideas were too abstract to understand, or didn't sound as if they would be fun, it was hard to motivate devs toward them. This was why it was crucial to communicate what was being made and how the game's unconnected parts worked together. The best resources game designers could look to were other RPG games, such as *EverQuest, Dark Age of Camelot*, and *Diablo*. The designer's formula for game creation was simple: Keep what worked and fix what didn't.

The reason most of the design was executed at the end of the project was because Blizzard always built their own engines and editors (for reasons listed on page 38). The WoW engine was great for managing a giant, open world filled with lots of players; it would be terrible for a first-person shooter because it wasn't optimized to deliver fast-action, precise hit detection, or synchronizing minute actions. But again, the trade-off in writing an engine from scratch means the game can't be tested until the end of the dev cycle, which in itself is a risk because it introduces a bunch of unanswered questions. For example, *how crowded would zones be?* Ghost towns weren't fun, but neither were overcrowded areas. *Could traffic be regulated without ruining socialization? How big should a party be and how long should dungeon runs take? How fast should players be able to grind through zones?*

And hanging over every design idea were limitations of processing power and security—no server-side feature could be expensive in terms of

processing, and features on the client (the player's computer) couldn't be critical because they could be hacked. MMO gameplay operated in this narrow technological bandwidth: Server-side features were cheap but secure (e.g., tracking inventory and monster behavior), whereas the clients handled expensive processes, which, if hacked, wouldn't break the game (e.g., rendering art, handling collision). Any game ideas that didn't fit within these constraints were rejected.

While programmers built the engine, the designers made the rules—which was like writing legislation, as rules needed to curb exploits by outguessing millions of players. A single loophole could trivialize content—and an MMO without meaningful content collapses like a house of cards. Many of them did. To learn how to avoid mistakes, designers spent a lot of time playing even obscure (and often terrible) MMOs and thought about how our game would compare; designers did this while the rest of the team pushed forward on code and art assets.

The risk of losing work due to design changes was mitigated by early prototyping and staying close to proven models. This is why small teams were so much more efficient—if the team hits a dead end, the loss of work was limited to only a few people. But MMOs were big projects, so prototyping was all the more difficult.

By far the hardest branch of gameplay to prototype was combat. Until designers had the right tools and supporting technology, the team was just building a game engine. For WoW, the pivotal moment in combat design came after the spell editor was finished. It allowed designers to bestow abilities on monsters and character classes without additional programmer support. Up until that point, all combat had been fake. If a character hit a monster with a sword, the damage wasn't "physical" damage because there weren't types of damage. And damage wasn't offset by the monster's defensive values, because there wasn't such a thing as armor or spell resistance. WoW's prototyped combat remained simple because designers couldn't tweak stats without bothering programmers to hardcode everything, distracting them from their job—coding the real game. Before character attributes could exist, a database was needed to support them, and for that to happen designers needed to tell the engineering team what they wanted in the database. Only after Twain Martin and David Ray created their database could Joe Rumsey and David write the tools that allowed designers to hook up the attributes, and only then was a sword a sword. Only then could designers define things like monster, quest-giver, shield, or fireball.

Once combat basics were functional, the character classes were created one spell at a time, from low- to high-level. But since character classes needed many abilities before their roles became distinct, it took about nine months of creating spells and abilities before group combat could be tested and defined. These tests let designers answer how far apart players would spread out, how many people could be in a party, or how many enemies they would fight.

Then they could address which classes had enough cool spells or which were the least fun to play.

Over the course of the project, game designers graduated from the theoretical realm of prediction and argument into the empirical domain of feedback and data. As wowedit empowered designers with control, their influence became more tangible and they metamorphosed into roles of data analysis and implementation—hardly the wishy-washy prognosticators they seemed to be at the beginning. The designers were almost world-weary by the end of the dev cycle, having been so saturated with feedback and experience they could almost finish everyone's comments for them. Not only did they have answers to questions, they spoke by rote, with great economy, because they'd already had the same conversation many times over.

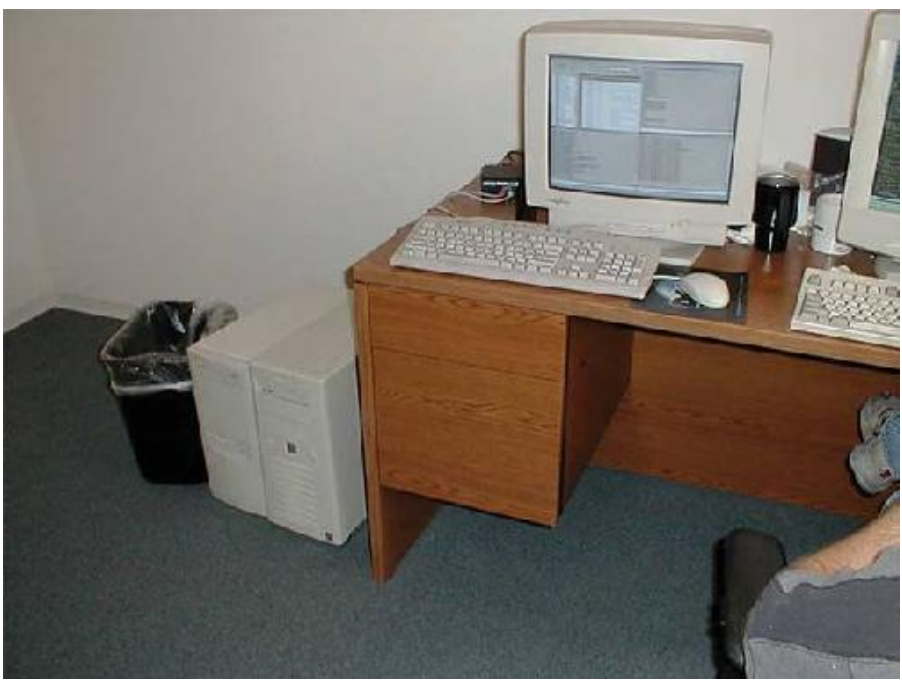
January 2002:
The Stitches of a Seamless World

After the holiday season, the offices grew busy again. With most of the team back from vacations, a meeting that kicked off the New Year also delivered the bombshell that both Team 1 and Team 2 were hiring senior game designers from outside the company. Up until now, all designers in the company were known quantities, vetted in QA. Even Rob Pardo had started in QA. But the WoW team had fifty people on it and it was now costing the company too much money to make major mistakes, and the deficit of seasoned designers on the project made management understandably nervous. Allen Adham was left to manage the store and he was trying to work less, not more; he was trying hard to come in only three days a week during semi-retirement, but the WoW workload was too great and Blizzard needed some full-time veterans with multiple titles on their résumé. "WoW isn't in trouble," Shane Dabiri reassured us. "We're taking our time and making sure we hire the right person." We all knew it would be interesting to see how someone from the outside the company fit into a leadership role. Shane also pointed out that John Cash was hired as the technology leader for Team 2 and had done a wonderful job managing such a colossal project. Also at the meeting the producers voiced their E3 strategies. If *Warcraft III* hadn't shipped by then, WoW would be sharing booth space. Our team would rather yield entirely to *Warcraft III*, ensuring exposure for that long-awaited title (partly because E3 was unfamiliar to many Team 2 members, and the pressure of presenting an undercooked game was unappealing). The answer ultimately rested in the readiness of *Warcraft III*, of which beta copies were being prepared. Mark Kern explained that since our programmers were either working on *Warcraft III* (optimizing frame rate for water and terrain) or doing database and low-level support for WoW, our game wouldn't look very different for quite a while. "We are doing the behind-the-scenes work, and you'll see gameplay changes only when we ramp up before our E3 showing." Fundamental shifts included things like switching game units from inches to meters, database support, quest support, dungeon server support, and terrain tools being written. These engine changes turned out to be messy as creature proportions went out of scale—players towering like giants and similar nonsense plagued the build while the measurements were synchronized. Another bug inexplicably rotated half of all the props in the game, which caused Collin Murray months and months of hair pulling. For weeks at a time, other bugs prevented the game from even launching.

There was a major stride made in terms of server architecture. Joe Rumsey had laid the groundwork for code that could handle seamless transitions from server to server, so as players crossed the continent, they

were supported by different machines without noticing. Joe demonstrated these seamless transitions by fighting and looting a monster across one such invisible boundary and it didn't appear any different than normal looting (which was the goal). Until we were sure we could pull this off, we were under the threat of having to guess how to divide the world into separate servers. After only a day or so of hunting bugs, Joe moved on to code that would support archery and ranged weapons, laying some groundwork for the ability editor that would enable designers to create real gameplay.

All the exterior zones for both continents had finished their first pass, which meant they were sized and connected together—but each had only a small demo area that looked remotely presentable. With Kalimdor zones blocked out, some of the exterior level designers were moving back to Azeroth to finish. Stranglethorn Jungle, for instance, had entire empty areas. As exterior level designers painted and sculpted the terrain topography, the artists Toph Gorham, Tom Jung, Brian Hsu, Dan Moore, and Justin Thavirat created concept sketches, 3D models, and textures that made up the trees, plants, and rocks littering the landscape. After the artists finished a prop, it was committed to the build so the exterior designers could begin placing it throughout the world.



Sitting on the floor in Joe Rumsey's office was the first WoW server. The box on the left was merely an update server, and the right-hand machine ran the applications that tracked monsters, player movement, character creation, and so forth. Eventually all those systems would split into separate machines for each realm. At this point devs used them only to check out the daily build. Photo by John Staats. Image provided courtesy of Blizzard Entertainment,

"Ship it!"

— A running joke Team 2 devs made whenever someone finished an asset, decision, or feature, as if it were the only thing holding the game back

Dark Age of Camelot was wearing thin for most of the team. The realm-versus-realm, high-level content was killing everyone's frame rate, so most of the company's MMO junkies returned to their favorite game: *EverQuest*. It didn't look like DAoC would be around when WoW shipped, so that meant *EverQuest* would still be the game to beat; even the gameplay trailer of the *Final Fantasy* MMO didn't look very competitive. Because Japanese game companies were console-based, they had never built a networked game before and probably weren't fully aware of the complexities involved. Here was where Blizzard's commitment to supporting battle.net paid off: We were *very* experienced. Even though one of the original founders of *EverQuest* had announced he was forming a new company that would create another MMO, we still considered EQ and *Star Wars Galaxies* to be our chief competition. It was rumored that SWG had to ship by the end of the year or the publisher would lose their franchise license, which probably meant their studio was also running behind schedule. MMOs are so incredibly hard to make. The most recent screenshots of SWG looked as if they were very far behind this deadline, so we were still pretty comfortable with our position in the market.

High-resolution version of the first Stormwind texture by Matt Mocarski, December 2001. Matt spent an entire day working on this texture and felt it was his best so far, even if it took too long. Getting the Warcraft look and feel down took time. After Stormwind was textured and doodads were placed, Matt looked at his texture in use and pooh-poohed it. He found it too busy, so he repainted it, greatly simplifying the design. Image provided courtesy of Blizzard Entertainment, Inc.

We were emboldened partly because we had shown so little to the public. Like every game developer, we were anticipating the day when we could show all of our game and see how eager fans were to play it. One time I asked Brandon Idol and Tim Truesdale, “Can you think of any other computer game that’s more complicated or ambitious than WoW?” They couldn’t think of anything “bigger.” It mirrored Eric Dodds’s observation that our programming team might be the strongest team ever assembled for a computer game. Although we may have been too inexperienced (or delusional) to make such grand pronouncements, it was telling of the team’s enthusiasm for the project and respect for one another. There was also a scarcity of friction, drama, or antagonism within the development team. From

time to time, people got grouchy, but since everyone worked so hard, we generally took it easy on one another.

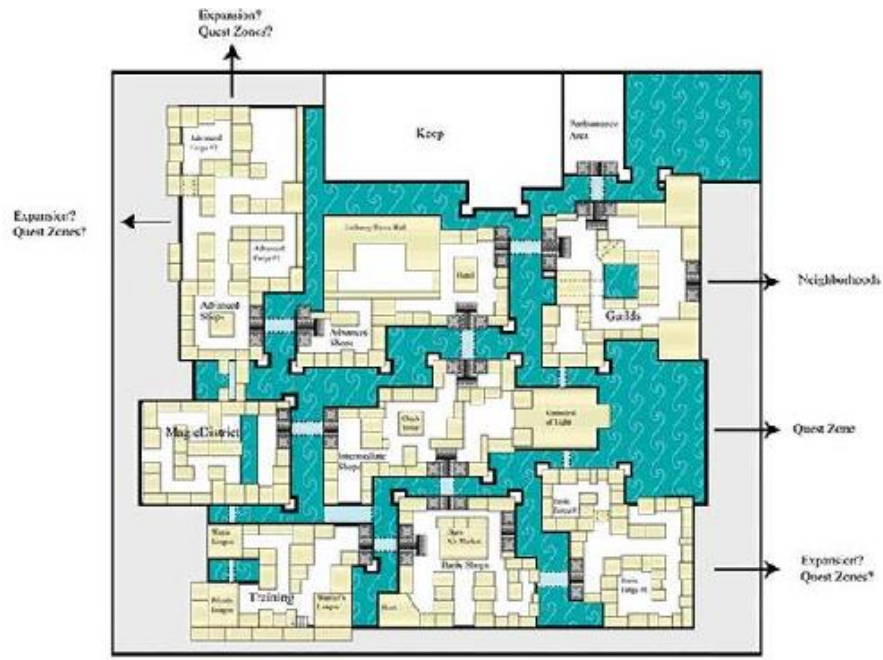
A magazine's postmortem of *Dark Age of Camelot* stunned us when it revealed that Mythic produced DAoC in eighteen months with a team half our size. Even though they started with an engine, their development speed was impressive. It was explained that the most difficult part of the game's development was its dungeons and cities, which sounded familiar to us. Our content was at a point where 80 percent of the planned monsters were finished; the exterior zones were getting close to having their "first pass" done, while dungeons lagged far behind. And still we couldn't find more than one texture artist for our 3D architecture.

Texturing for architecture and environments required a rare skillset. Brian Hsu is an amazing artist who helped make props for the exterior zones. Both Brian and Tom Jung (who was also a concept artist) tried and hated painting textures in Radiant. They found the idea of painting variations of walls uninspiring, and neither liked the look of Radiant's brush-based geometry. Even after we abandoned Radiant in favor of 3D Studio Max, almost none of our artists developed a knack for painting dungeon textures. The experiment of Matt teaching Team 1 artists how to paint architecture yielded only one recruit: months later, another ten-year Blizzard artist, Stu Rose, would move from Team 1 to Team 2 to help us out, but even he often found that painting for architecture was outside his comfort zone.

In fact, only the most recently hired level designer, Aaron Keller, had experience making levels with 3D Studio Max, so he was easily our fastest 3D modeler. Aaron was dauntless. While the rest of the level designers blanched at the thought of building a city the size of Stormwind, Aaron shrugged, said it was all of matter of copying and pasting, and had a running prototype in a matter of days. *Days!* Aaron and 3D Studio Max had delivered a rendering test that would have taken Radiant so much longer to create. The architecture was all placeholder (they were facades, like a movie set), but he was able to build and run around an untextured neighborhood. Designers weighed in next on the city size, and the prototype gave everyone a familiar frame of reference when talking about its scope. Even though all the prototype geometry was thrown away, having tested a city in-game was a very big win.

Because of his expertise, Aaron was slated to build all the cities except Ironforge. Cameron Lamprecht was assigned to the dwarven city, as well as assisting Aaron with Stormwind. Aaron created a score of buildings based on Tom Jung's sketches and concepts. Tom was the dungeon team's first concept artist. He brought the *Monkey Island* flavor to Booty Bay and helped Dana Jan with sketches of the Deadmines. After Tom's Stormwind concepts received unanimous approval, Aaron started building neighborhoods of untextured buildings for rendering tests. These told us how smooth the engine would run while in cities. Aaron spawned fifty human bots to represent the other players and the town's NPC inhabitants. On a low-end video card, we were getting

thirty-plus frames per second, and this was a very good indication that the sheer amount of city geometry would not incur rendering problems, although the question still remained about how many textures could be used. Since every character had their own unique texture, we couldn't be sure how many to use on the environment. Cities always raised question marks: How many players could be shown at one time? And how much of the city could be shown at once—could the players look over rooftops and enjoy a genuine cityscape?



Stormwind city plan, December 2001. The goal of a city plan was to distribute traffic equally so players didn't bunch up together and ruin one another's frame rate. City size and occlusion methods were unresolved issues; we were not even sure what gameplay went into the city. We theorized gondolas could quickly ferry players from one district to another, but alas, the technology of such a feature was prohibitively esoteric. At first, Stormwind Keep was in the center of the city so it could be used as a beacon to navigate by. After we tested this and realized players always looked down, Aaron and Eric decided to use a cathedral spire in case anyone ever bothered to look up. Image provided courtesy of Blizzard Entertainment, Inc.

We had similar issues while trying to improve on *Everquest's* technique of giant trees. We wanted thick, claustrophobic forests with trees close together. But when Justin Thavirat tried various art tricks and visual illusions (like fake canopies to imply lots of trees) nothing worked very well. The answer for forests was threefold: optimizing the engine to render repeating elements faster, economizing the tree geometry, and scaling up the trees to *Everquest* proportions so it wouldn't take hundreds of them to fill out a forest.

It looked as though cities would be accomplished with their own set of strategies, mostly to keep people from seeing too many characters at once. Tests indicated rendering hiccups would come not from the architecture but rather from crowds. This would be a problem because designers wanted things like a bank, an inn, and a mailbox to be close together (this was long before auction houses were added), and there weren't easy ways to dissuade players from swarming together at one location.

Stormwind started out big and was scaled down with every pass. The success of Aaron's prototype had convinced producers Carlos Guerrero and Shane Dabiri to create a new schedule for the interior level designers. Their new plan aimed to finish thirty dungeons, ten mini-dungeons, various buildings, and six capital cities; they also guessed there would be defensive structures needed for the six realm-versus-realm (RvR) battlefields by summer of 2003, when we expected to go beta, which gave us less than eighteen months.

Content creation wasn't the only group making progress. Mark Kern, the producer for engineering, sent a Team-wide email with updates from everyone in programming.

> Programming Status Update:
>
> Jeff and Jeremy have finished their tasks for *Warcraft III* and are now back working on *World of Warcraft*. Tim has been working late to work on both *Warcraft III* as well as fixing some WoW stuff here and there. Unfortunately, we won't be getting Tim back fully until the end of the month. Collin has also been working the wee hours and weekends fixing all the exporter bugs that plague both us and *Warcraft III*. He should be done with these today or early next week. John has been working with Twain to get console security in, so we can have cheat-free games and lay the groundwork for GM permissions. John has also created a way for all formulas in the game (combat, mana regen, etc.) to be specified in wowedit by the designers. Designers can twiddle with the way the game plays at will now. Twain is almost done with the initial interface to this code, and that should be in today or Tuesday. Joe has made our servers strong, like Russian Tank! We have seamless transfer between multiple world servers now. Our world truly streams! Sam is taking over all things dark and crawly. His dissection of the Monster Code to support our new architecture is well under way. In the meantime, Monsters don't really move or attack in the game, and won't for a couple of weeks. Collin, Scott, and many others have finished the conversion of our units to a new scale to eradicate the problem we were having with palsy-shaking characters and z-fighting issues at extreme edges of the world. Scott has also resolved many portal issues in dungeons and has begun work on Foreground Doodads. David has been working on our Quest editor and trigger system, which will be several months' worth of work. In his spare time he's been helping Scott by finishing the editor for Foreground Doodads.

Stay tuned for another exciting update next week!

Markus

February 2002: We Built This City

Producers Shane Dabiri and Carlos Guerrero and lead animator Kevin Beardsley returned from a sleep-deprived four-day exhibition in Paris of WoW to Blizzard's parent company, Vivendi Universal. They gave us a recap of the trip, and Carlos showed his photos of his travel companions either sleeping in airports, toasting in restaurants, or speaking at press events. Team members had traveled to shows in Tokyo, London, and now Paris. "Promo-vacations" were split up between as many team members as possible so people weren't too envious of the company-paid drinking binges on foreign soil. Vivendi was so happy with what we showed that we didn't have the heart to tell them the build was the same, stable one we had used at the ECTS in London six months earlier and not the crashy, current version.

A treat was in store for the producers upon their return from Europe—finally there was some happy news from the dungeon team. Aaron Keller and Matt Mocarski had applied the first pass of textures to one of Stormwind's six districts, and the results were terrific. They settled on an on-screen budget of fourteen textures. Aaron and Cameron Lamprecht had been working on Stormwind for three months, and the current version had six districts, only one of which was textured. Shane brought Allen Adham into the dungeon room to show him the progress. Allen was so impressed he didn't want to show off the city at the next E3 because he didn't want to raise the bar for competitors to shoot for. Allen thought it made more sense to impress people when the game got closer to being finished rather than a year before it was on the shelf. This was a typical, strategic Allen-decision, as he was the World's Most Patient Person. It looked as though we'd be more tight-lipped about the project, making discussions with the press harder, but selling magazines was last among Allen's considerations.

Aaron and Matt got Jeff Chow (who had engineered WoW's sound code) to hook up Stormwind's zone music to an MP3 of Jefferson Starship's saccharine pop song, "We Built This City." It was worth a laugh because the song was so reviled, but after a few weeks no one thought it was funny anymore. People muted their sound and Eric Dodds remarked that he hated checking out trade skill vendors because of "that stupid song blaring into my headphones." This arguably made the practical joke funnier, but everyone breathed easier after it was removed.

Dungeons also got another boost with the acquisition of Stu Rose, a longtime Blizzard artist from Team 1 (he performed the dull-witted peon voice-overs for all the Warcraft games). He started working on the Deadmines textures, the first dungeon to be textured. He was a bit daunted by the enormity of the ogre juggernaut moored at the docks at the end of the

dungeon; in all of his ten years at Blizzard, the largest assets he'd worked on were single texture units for *StarCraft* and *Warcraft*, and now one of his first tasks was a giant ogre juggernaut. Welcome to WoW, Stu!

After deciding not to show our nascent progress on dungeons and cities, it looked as if everything else was on track for our 2002 E3 showing. The team was working late nights twice a week, with some still working late five nights a week; a couple of us even came in on Saturdays and Sundays as well. We had almost finished overhauling our temporary combat system into something real. Monsters could use weapons and abilities and their damage followed the game's global combat tables instead of hacked-in, hardcoded values. Players could exchange items with each other with a rudimentary trade screen. Jesse Blomberg, the last programmer we planned to hire for the project (spoiler alert: he wasn't), was slated to handle our extensive web presence. Chat forums, personal pages, and statistics tables for players all needed support. Jesse also would be in charge of writing tools that allowed game designers to quickly equip monsters and character with items and spells while in-game.

March 2002: Competitive Collaboration

Lineage II by NCSOFT was announced in March 2002, and we were impressed by the previews. The game would launch with a built-in audience of four million *Lineage* subscribers, and their first 3D game was visually impressive. Their project had seventy people on their development team, which sobered us up to the idea that we were also competing with bigger teams, since games in this genre depended on a lot of playable content. *Lineage II* looked like a strong competitor in the MMO footrace. Others members of Team 2 were less concerned because NCSOFT was using the *Unreal II* engine, a solution Blizzard had investigated and decided was unsuitable for an MMO because of poor frame rate on low-end systems. Blizzard veterans generally considered games that cater to high-end systems to be uncompetitive, since the vast bulk of the audience doesn't have powerful machines. But it was healthy to be paranoid and infinitely more fun competing with dev teams who could make great-looking games.

Blizzard's top designers visited Verant's offices (makers of *EverQuest*) and learned that they admired our interface in CGW Magazine so much they outright admitted to copying it verbatim (although it was our old interface, the one we showed at the ECTS, not our clean "everything-at-the-bottom" edition). They released their clone in a patch for EQ. Since everyone steals from everyone else, we didn't hold a grudge, but it justified Allen's strategy of not showing more of WoW until we were closer to a release date. Although it was more fun for fans and the press to ruminate about our latest features, it was smarter to play our cards close to our chest. Although secrecy lowers morale, we realized it was best for the company, so our first E3 show would be fairly low-impact. At the March team meeting, Mark Kern informed everyone that they would each work a four-hour shift at one of the eight stations for WoW. He explained we were not to apologize for our "unfinished game" or promise how good it was going to be. We didn't want the competition to ramp up their efforts when we were so far away from our release date.

Every year, Blizzard sent a few members to the Game Developers Conference (GDC) to see what the rest of the industry was doing. Those who went brought back ideas and shared them with the team. Eric Dodds made a report of things he saw in the conferences that could possibly help or were relevant to WoW. He said the panels weren't terribly informative, but even unremarkable discussions stoked his imagination. The following is an abbreviated version (I removed over half of his bullet points) of the GDC email Eric sent to the team, which illustrates aspects of game design issues under consideration:

Eric's GDC Report

Community Topics

The big MMORPG topic at GDC was community and how you create that community in advance so that on launch day you have a large group of people who are ready to buy your game and to tell others to buy your game. We do not have as large a problem in that area as other game companies will, but we certainly should be concerned about it, as there will be a large range of MMORPGs out on the market when we ship and we need to have people who are playing other MMORPGs support ours. We cannot just rely on the Blizzard name on this one. There is a book that I got at the Con about this topic that I can recommend, even though I have just skimmed it so far—*Community Building on the Web,* by Amy Jo Kim.

Web Presence Topics

This is related to community, but it is an area that we don't do such a great job at right now. We need to support our customers with a number of features that serve a number of different functions:

- Remove problem posters.
- Reward good posters.
- Allow posters to feel they have some "ownership" in the area that they post.
- Have a community manager who actively manages the web community. They should be a politician and a sympathetic ear so the players feel like they have a voice into the company.

Tradable Item Topics

This is regarding a talk given by Richard Garfield about tradable object games. He referred to both *Diablo* and *Magic: The Gathering* heavily in his talk and I had not previously thought of our game as exactly a Tradable Object Game. There are some ideas and terms that he used that are useful to us.

"Vanity Object"—an object that has no gameplay value over other objects of its type in the world, but looks different. An example would be two different shields, both that are AC 10 and level 5. One of the shields is easy to get and has a wooden texture; the other requires a hard quest to get and has a skull texture. The skull shield is a "Vanity Object" and has more value than the wooden shield, though they are functionally identical.

"Bad Object"—an object that is clearly worse than other objects of the same type in the quanta. These objects let players pick "good" objects and thus lets them feel like they made active positive choices. Also, "bad" objects increase the value and desirability of "good" objects. *Diablo II* did an excellent job of creating "bad" items.

"Item Retirement"—items need to be either retired from play after a certain amount of time if you want to introduce new items that players are excited about. There are three ways of cycling in new items that players would be excited about:

- Items have finite charges (this method sucks in general).
- Items have a finite lifespan (magic cards in the tournament scene).
- New items are better than old items (*EverQuest*).

"Offline Gameplay"—the player should be able to play the game even when they are not actually in the game. To facilitate this the player should be able to play or at least check specific things (friends lists, in-game Investments, etc.) from a website, or better yet from a cell phone.

Specific Topics for WoW:

- Create a wide variety of "Vanity Objects" in the world. These are Items that have different textures, icons, or even audio differences even if their stats are the same.
- Create a number of "bad" Items at each quantum that are too weak for their level.
- All items need to be no drop, or have durability. The durability should be so slow that a player hardly notices it, but the item should leave the world eventually.
- A website community that opens a year before launch (opening a year before launch means we will attract critical mass around 6 months before launch). This community should have a way for players to choose their name and even enter a guild pre-game. They should be able to reserve their player's name on a server before the game launches so they are attached to the game before it comes out.
- Guild support built into the website. Players should be forming their guilds before the game comes out. This will incentivize players who are old hands on the forums to talk to new ones as players form their guilds.
- A politician running the boards that can talk as a real person and not have to go through four layers of approval before posting anything.
- Players should be encouraged to play a second character through the game, after they have finished the game with a first. At the same time, we should give players a reward for getting a character to the highest level. To facilitate this, any time a player has a max level player on their account, any new characters they make start at level 10 automatically with a set of no-drop level 10ish items.
- This year's E3 is the first place we will get interface thoughts on how easy it is to use the product for the first time. We should consciously

watch players at E3 as they try to play the game and note where they have trouble (before we tell them how to play the game)

If we are going to have stealth in the game, there should be a place that displays your “stealth” in the main character screen. To support a stealth mode we need a few things:

- Monsters could have a suspicious mode—they think someone is near, but do not know.
- When a monster is in suspicious mode, they need to have an audio cue that is clear.
- Players would have a “Stealth” attribute, the higher the better.
- Sneaking, running, or other things will change the player’s “Stealth.”
- Stealth indexed against target level determines how far away you can see the character in stealth.
- “Player stealth” is indicated by a buff icon. That icon changes color depending on how stealthy you are.
- We are going to need a fast path for testing quests. We do not want a designer to have to put a quest in and then wait for the next build to test it, and then fix it and wait for the next build after that to test it again. We need a designer to be able to test on the fly.

April 2002:
The Occasional Paradox

Artists Roman Kenney, Justin Thavirat, and Brandon Idol had been focused on character outfits and equipment for the past few months. Listening to them explain how many equippable items would be in WoW made my head spin. The texture coordinates for all the races were identical, so breastplate artwork that stretched over a tauren male also proportionately covered the dwarf female, and so on. In other words, one texture fit all sizes. Forty-eight common outfits were planned for the player characters, divided between four types of armor: plate, chain, leather, and cloth. Each armor category then broke down into a series of upgrades: leather broke down into studded, reinforced, hide, and so on. Each set had its own art and color variations and was broken up into pieces that mixed with other sets, allowing for unique character and NPC outfits.

Weapons worked the same way. An ivory decoration on a short sword could fit on other types of swords, as well as be scaled up or down. Different options of patterns (multiplied by color and size variations), provided the game with enough diversity to allow players to look unique.

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Texture component system for player characters, April 2002. The texture mapping was painted according to the player-model coordinates. The size for player textures was 256 x 256 pixels. Variations on color and design elements allowed for new outfits, so a player would likely mix and match from different sets. The pieces from each set were procedurally baked into a temporary and unique texture. For every ten players in view, there were ten unique textures sent to the graphics card. Image provided courtesy of Blizzard Entertainment, Inc.

Rob Pardo, lead game designer for *Warcraft III*, sent monthly updates to his

team about the new things added into his project. After receiving one such email, Allen Adham followed suit with an update describing what was new to WoW. Given Allen's schedule, no one believed he would maintain the pace of *monthly* updates, but it was the thought that counted.

Allen wrote that there were over two hundred spells/abilities for the three classes (warrior, mage, and shaman), and players had the ability to gain experience for kills, so characters could gain levels. The only caveat was that the designers hadn't created stronger versions of these spells for higher levels, so all gameplay remained at a low level. The first pass of the real combat system was working, and the fake combat tables we had used to demonstrate how the game played were all gone. We switched our selection method to left mouse clicks, while right mouse clicks performed contextually appropriate actions. Trade, inspect, loot, and merchant interface were all initiated by right clicks, and players could also right click to invite someone into their group. Grouping functions were working as planned. Party leaders could promote or kick out subordinates, and party chat was working. The spell books and action bars were also functional, so players could drag abilities onto their interface. Stormwind and the Scarlet Monastery (both of which were mostly empty) were in the world for the first time and were open for inspection, as seamless streaming between non-instanced interior/exterior zoning was now finally working. Since pathing code for interiors was still in progress, there weren't any monsters in our dungeons, so a temporary system for pathing and artificial intelligence would be used for E3 demos. On the horizon would be a working interface for banks, reputation, and quest givers. Non-player characters (quest-givers, vendors) were around the corner, as well as new items, spells, abilities, and creatures. All but ten monsters were finished, so the animators were back to playable races—notably dwarves.

Deadmines boss room by Dana Jan, March 2002. Because an instance disengaged players from the rest of the server's population, if anyone looked out a window, they would see a duplicate of the "real" world, a facade. The question was what would happen if they jumped out and how would we prevent them? These were the early instance conundrums. In the case of the Deadmines, an offshore ogre juggernaut couldn't be cleanly isolated from the "outside world," so we enclosed it in a cave. Images provided courtesy of Blizzard Entertainment, Inc.

Curved pathing, April 2002. Sam Lantinga implemented Tim Truesdale's code that controlled monster pathing based on splines instead of straight lines so as to emulate a more natural movement. This screenshot visualized how spline pathing worked. This was our attempt at preventing monsters from making sharp turns. The circles that appeared on the ground in debug mode were cool to watch, but sadly there was no way to procedurally regulate how sharp or wide path-curves should be, so spline pathing was ultimately abandoned. Image provided courtesy of Blizzard Entertainment, Inc.

With a working quest system, two quest designers were added to the team: Pat Nagle, who traced his roots to QA, and Jeff Kaplan, who was the company's first outside hire to game design. Jeff had made himself known with his *EverQuest* blog, which regularly dissected and discussed game design decisions. Allen and a number of game designers liked Jeff's approach to MMO design and invited him to the project. WoW was Jeff's first exposure to game development, so he started out next to Pat, making quests with wowedit's new quest scripting tool.

Everyone enjoyed seeing visible improvements being added to the game again. With the back-end code implemented, the project appeared to be on target toward making our E3 goals and its first public appearance. Both *Warcraft III* and WoW would have six machines for visitors to check out, and two PR stations that catered to the press. The artists rendered a booth mural of Stranglethorn Jungle and made two different shirts for the event. Although we weren't showing them at E3, dungeons were looking more finished with a new doodad tool that allowed us to rapidly place objects. Dana Jan's Deadmines, Jose Aello's Northshire Abbey, and Aaron Keller's Monastery were all getting their first pass of lighting and props.

The Deadmines especially were the focus of debate. Chris Metzen's story of the dungeon called for the grand reveal of an ogre juggernaut moored offshore. Yet no one could figure out how to pull this off. If players in Westfall saw the juggernaut, it would seem strange that there would be no explanation as to why the warship was there. Yet if they saw nothing, it would break continuity between the world and the *instance*. (Instances are little parallel dimensions where players can focus on difficult monsters without any interference from outside players.) If players killed the boss and jumped in the water, they would expect to be able to swim to shore, which couldn't happen because the dungeon server and the Westfall server were connected only by a teleport location at the entrance.

After days of discussion, Dana severed the dungeon from the outside world by putting the ship inside a giant cavern (the *Goonies* solution), which prompted changes to the engine because interior spaces weren't supposed to be that big. Scott Hartin grudgingly extended the engine's farclip setting (which controls how far the player can see before geometry disappears) to accommodate the special case. He warned the producers, "If we push back the farclip, it means all the level designers are just going to keep building bigger and bigger rooms and we won't know if the frame rate will crap out or not." Of course, that was exactly what we did. The dungeon designers all started building bigger interior spaces, but testing showed that the frame rate cost was negligible.

The Deadmines doodads, April 2002. Dana Jan's dungeon was one of the few interiors to be textured, lit, and filled with doodads. The grand finale room, the juggernaut harbor, would not be shown at E3, in accordance with our don't-show-too-much-too-soon policy. Notice that Dana's character was holding a lightsaber: Kyle Harrison created it for kicks—and for a short while everyone on the development team ran around with one. Image provided courtesy of Blizzard Entertainment, Inc.

May 2002:
Opponents in Masquerade

In preparation for E3, the team had worked late nights twice a week since April. By May, we were working late every day of the week, and a few of us were working on weekends. I was already working long hours, so the only difference to me was that it gave me company on the weekends. Weekend work was cool because I could see what people wanted to work on; there was a sense of camaraderie, and people were usually in a better mood than on an average, obligatory weekday.

Our designers and artists were busy play-testing the single-player campaign of *Warcraft III* and sending their feedback to Team 1. We told them what levels felt too hard or too easy—and, of course, we found a few bugs and balance issues. *Warcraft III* felt solid and balanced, so it was more fun to play, but since we had been testing the same eight campaign levels every day, it wasn't as fresh anymore. Our efforts were part of a company-wide crunch to polish *Warcraft III* for its imminent shipping date, and work continued until the end of the month, when *Warcraft III* went gold, after which we took a couple of days off to recuperate from the not-so-bad crunch period (at least not so bad for Team 2). Although our late-night schedule was "officially" over in May, a small band of us (usually me and a number of programmers) kept burning the midnight oil. Despite our assistance to Team 1, Team 2 was still able to test, fix, and polish three human zones in WoW for E3. We pulled only one all-nighter before the trade show, so our mini-crunch wasn't too terrible.

We did find small opportunities to blow off steam. At lunchtime, half the team left for restaurants, while the rest ate their food at their desks, played board games, or hopped onto the company's *Counter-Strike* server. The animators had been playing *Warcraft III* multiplayer games for weeks at lunchtime and became some of the best players on our team. When the animators challenged to the dungeon department to a five-on-five battle, they knew it wouldn't be an even contest. The animators knew we weren't very good (we never played multiplayer games), so it was a questionable prospect from the outset, but the devious dungeon team agreed to the contest just to be "good sports." The animators redoubled their lunchtime practices to coordinate as a team. They practiced for days and expressed their mild surprise that we weren't doing the same. I imagine they were emboldened to hear us blow off the notion of organized team play: "Nah. We're just gonna play for fun."

"If you're not willing to cheat, it just shows that you don't care."

—John Staats, quoting himself in his own book

On the morning of the battle, the dungeon team procured pinch hitters without telling the animators; specifically, the best real-time strategy (RTS) players in the company played in our stead. We insisted each team play behind closed doors to prevent anyone from "stealing strategies," and the animators happily agreed, looking forward to their easy win. The dungeon doppelgängers deftly rolled the confident animators without losing a single base, player, or skirmish. Moments before the end of the match, the ringers absconded to let the novices on the dungeon team take credit for the win. The animators were stunned speechless—as they tried to comprehend what had just happened, the rest of the team giggled behind their backs. The cruelest part of the ruse was that no one let them in on the joke until many years later.

WoW's debut impressed other developers more than journalists. We had only a few crashes, displayed evidence of solid gameplay, and had a terrific frame rate. But being tight-lipped had cost us inclusion on any of the best-of-show lists, and in some cases, we were not even mentioned in MMO wrap-ups. We simply gave people access to playable zones and watched them go, unlike many of our PR-focused competitors who were intent on creating a buzz over ridiculous claims (such as allowing dragons to be a playable race or offering dozens of classes, unrestricted PvP gameplay, infinite exploration, or destructible player-built castles). One had even talked their way into winning a best-of-show award despite not showing *anything* but a cinematic. E3 coverage was a parade of new concepts and innovation, even if novelties weren't essential to making a game fun. There was a widening gap between the WoW developers and computer game journalists—which was a diplomatic way of saying we didn't respect them. The press weren't savvy or independent enough to critique outlandish claims made by what looked to be fly-by-night studios trying to cash in on the MMO bubble. Instead they wrote glowing stories that misinformed gamers, who were being conned out of fifty dollars per game. It was poisoning the reputation of the MMO genre itself.

A big reason the press was snubbing us was because we were keeping quiet about our release day. We adopted the wisecrack-response, "When it's ready" to answer questions about our shipping date. Fielding queries about deadlines was impossible for complicated 3D titles, and Blizzard wasn't going to play that game anymore. The early *Warcraft III* team made their best attempts to predict when they would be finished, and it only made Blizzard look disorganized at best and dishonest at worst when those projections were missed by *years*. We didn't know when we were releasing *World of Warcraft*, so we staunchly refused to give phony dates. "When it's ready" was a declaration of our breaking from the developer–journalist symbiosis prevalent in the industry. It reflected a more self-confident attitude, one that rejected the paradigm of premature promotion and dubious gameplay promises. If the product was good, it didn't need to be inflated.

So while journalists chased shadows, the smart questions were being asked by members of the industry—other developers who devoted their time to studying our game. Although some of our features were missing, the engine showed tons of potential for those who could recognize it. They could estimate how many textures we were using in a scene at once, or they could see how we were rendering our water. Competitors could have one-upped us if they had the right engineering team or targeted minimum-spec systems, so it actually wasn't totally correct to say we were being tight-lipped. We talked about our frame rate performance on low-end video cards and our stripped-down approach to game design (removing painful game mechanics was a new

concept back then), all of which impressed developers, but not journalists. One could surmise the press might have been fooled so many times it was likely they just didn't believe us. Design-wise, we had greatly simplified the MMO experience and yet there was a paucity of articles about removing empty promises, annoying gameplay paradigms, and dead-end ideas from MMOs—instead, headlines celebrated games that *added* them.

Publishers were just as annoyed that we weren't predicting release dates. They didn't want to release their MMO at the same time as WoW (and we couldn't blame them, given the Blizzard fan base). As a result, the publishers were standoffish about showing us what they had. The Sony booth refused booth admittance to anyone from Blizzard, so like everyone else, we watched movie demos on the Internet for *EverQuest II* and *Star Wars Galaxies*. The *EverQuest* devs were cool; however, it was always their publishers who kept us at bay. It was a fair play, but discouraging for the George Lucas fans on our team who had wanted to see a 3D version of *Star Wars*. We weren't so disappointed after we learned SWG was showing a canned tech demo, not a playable game, so at least we knew they weren't shipping in 2002.

Since other MMO studios were talking about their release dates (even if they were wrong), discussing bold new ideas (even if they were stupid), and promising frame rates (which they couldn't deliver), the limelight was theirs. We weren't too put off, especially since this year was supposed to be *Warcraft III*'s last pre-launch hurrah, so WoW's ho-hum first showing was fine. Next year's E3 coverage would be a different story.

We work hard and we play hard, June 2002. Tim Truesdale's office decorated for his birthday; culprit and programmer Monte Krol leaves the scene of the crime. Monte was on Team 1 working on *Warcraft III,* although he spent much of his time bouncing between the two projects since they shared some resources. If one project fell behind or needed help (such as Tim's office needing a good makeover), people from other teams gave a hand. Photo by Collin Murray. Image provided courtesy of Blizzard Entertainment, Inc.

June 2002: The Secret Sauce

The dungeon schedule was reassessed because we were falling farther behind—two texture artists was not enough for the five level designers. A year ago, hiring a texture artist for dungeons was made a top priority for the recruiters, but so far very few applicants qualified for the position, even after we had announced our game. While the Wailing Caverns, Razorfen Downs, Razorfen Kraul, Gnomeregan, Uldaman, and Shadowfang Keep were all built and waiting to be textured, the two texture artists were busy on other things. Matt Mocarski was texturing orc and dwarven cities, and Stu Rose was working on the Sunken Temple. In Team 2 parlance, a "micro-dungeon" was a non-instanced dungeon in a public play space, and we had many of them finished and waiting for textures—the ogre mounds, a shipwreck, two hive tunnels, two mountain caves, and three crypts—which brought the grand total of unique texture sets to a dozen, all without any texture artists working on them. Three Team 1 artists were allocated to the task of helping Team 2 catch up on their dungeon texture schedule, although the task (again) proved to be too alien for them to be helpful (none of their textures made it into the game).

Meanwhile, another exterior level designer position was opened to help since the exteriors were lagging behind the game's shipping schedule. This was a surprise because we thought landscaping was ahead of other departments. In our effort to make three playable human zones for E3, the exterior designers had learned that it took *far* more time to polish an area than our initial estimate. Learning this early was one of the few tangible benefits to E3. Preparing for a tradeshow was like that sometimes: Time was lost polishing temporary art, design, and code, but sometimes it forced us to learn things early and it saved us man-hours in the weeks and months down the road. Accordingly, producers adjusted the zone schedules based on the new estimates. Kalimdor was still largely untouched (aside from Gary Platner's demo areas), so Azeroth remained the focus for the exterior designers. Meanwhile, artists were still churning out doodads and detail doodads (tall grass, small rocks, flowers, etc.) so the exterior level designers would have the art assets needed to finish Azeroth.

Roman Kenney was one of the three artists dedicated to texturing armor components. He added a cape to a player model to show the game designers that capes don't "cover the coolness" of armor sets. Kyle Harrison had advocated for them a year before, but the results of his tech demos showed that procedurally-animated capes were too expensive to implement. Roman's example used the tabard-animation that added almost no loss of frame rate or dev time to implement. The game designers' original plan was to use tabards (instead of capes) because they didn't obstruct the player's view of their

precious armor. After the designers returned from vacation (they were using it up before the long march of crunching began) there was much hand-wringing before the weight of popular opinion of the artists prevailed, getting capes onto the "approved list."

The programmers finally added auto-attack to right-click functionality to simplify combat. This would help the process of selecting and attacking monsters, arguably the weakest aspect of our E3 presentation, and it was one of the things we had learned to improve while watching new players figure out how to play.

Allen Adham had given up looking for his replacement and accepted the role of lead designer, which meant he would be with WoW for the rest of the project. Mark Kern had taken over Shane Dabiri's responsibilities as team leader, since Shane had developed an ulcer (leadership had its costs). Nothing had really changed; everyone knew Mark and Shane were running the show and had been since WoW's beginning. Mark was still the producer for programmers, Shane still led the artists, and Carlos was still in charge of quest and level designers.

We were aiming to ship the game at the end of 2003, and for the first time, conversations drifted toward cutting features in order to achieve that goal. So far nothing had been decided, but player housing, mounts, PvP, underwater combat, and other major features were on the chopping block. E3 had awakened us to the reality of competing with the releases of other games, but no one really knew if it was better to release before or after *EverQuest II*. The biggest benefit of releasing after EQ2 was that more people would be accustomed to the subscription revenue model. We had learned about some of *EverQuest's* concurrency numbers a couple of years ago on a paintball excursion between the EQ and WoW developers (about a dozen from each company). The EQ team had confided that their subscription numbers went up every time a competing product came out. Everyone checking out a new MMO had opened up more customers to the concept of subscriptions—and when the new game flopped, the user base migrated to *EverQuest*. Competition was good for games. The fallacy about competing products probably came from the movie industry, where films have only two weekends of revenue. But time and time again, games in the same genre coexisted. Another marketing myth Blizzard dispelled after *Diablo II* was released was the danger of missing holiday sales. When *Diablo II* slipped into the next year, our sales were still as strong as we had predicted for Christmas. After that Blizzard stopped bending over backwards trying to ship before the end of the year.

As an ex-advertising guy, I noticed a pattern emerging in Blizzard's philosophy toward business, one that devalued marketing. The upper management seemed content with mostly word-of-mouth renown for our products. This, coupled with their insistence that every person in the company be a gamer, created a marketing-free culture where it was safe for geeks to be

geeks. Wariness of marketing came from watching salespeople ruin other studios. Some behaved like sharks, eating up companies from the inside out, schmoozing their way into decision-making positions where they didn't belong. Blizzard feared them because its employees were, let's face it, a bunch of propeller-heads and couldn't compete in meetings with these type-A personalities. My experience with marketing professionals wasn't so stark: They were intelligence officers who study the big picture of an industry, often crucial for company-to-company meetings and negotiations. But I could see there was a good reason to build a Chinese wall between suits and development. Too often marketing believes what they read on the Internet—and it becomes a liability when their input is applied to *internal* decisions like project development. Since computer games are incredibly abstract and complicated, knowing about another company's past success rarely translates to the creative process, where smart decisions come from close observation. Empirical evidence is more reliable than *a priori* paradigms.

This thought dovetails directly into Blizzard's valuation of fun. Gameplay trumps everything, and finding fun is more important than conventional wisdom, licensing trends, publicity, analytics, innovation, monetization, or any other facet of the entertainment business. If fun was expensive to find then so be it. Most publishers aren't willing to fund projects based on prototyping; they expect studios to have complete blueprints before investments are made, which are largely unrealistic expectations. But studios need money to make games, so deals are often made for barely funded projects, thereby crippling the developer's ability to change direction whenever unforeseen opportunities or problems arise. Because Blizzard projects aren't locked in a financial trajectory, its developers can focus on iterating and polishing their products.

For other companies, the publisher's distance from the product is the fundamental flaw in the process; they have a very hard time judging the value of their venture—namely, will their game be fun? Game development is so complicated that there are many ways to hide flaws, fake progress, and deceive anyone scrutinizing an unfinished game. Because computer games are often terribly dull to play until the very end of the dev cycle (especially those by companies writing their own game engine), it's difficult for publishers to evaluate a work-in-progress. The waters get even muddier when dodgy studios can accredit themselves with favorable hype.

Often the Team 2 devs circulated articles about such projects and discussed how someone was obviously being ripped off. It's the risk publishers took in cashing in on the latest fad; some studios can smell dumb money a mile away. So much capital is at stake, MMOs seem to attract dishonest people, and publishers are regularly bilked out of their money. Of course, the employees actually working on the games might not know if the business side of things is rotten. Sometimes publishers try to solve issues by getting involved and redirecting the project themselves, but such input is

rarely helpful. Even with ongoing audits and reviews, trust is nearly impossible on either side of the relationship.

Even if everyone's intentions are honest, ineptitude is common in industries like this where there are so many specialists, from managers down to employees. Middlemen are often brought in to mediate the process, but they too are subject to mistakes or pursuing their own agenda. The frosting on top of this mess is the incessant threat of budget-killing lawsuits common in the software industry.

These were the horror stories I'd heard from job candidates coming from other companies. I interviewed veterans who'd worked for eight years in top studios and never shipped a game because of cancellations and changes from marketing. Some publishers didn't allow their developers to play games, even after-hours (this was especially strange to us, since Blizzard encouraged this, stocking its hallway game cabinets with free copies of games for people to check out on a first-come, first-served basis). Yet some studios considered familiarity with other games bad for morale and prevented their employees from hanging posters from other projects or properties (including movies) because they didn't reinforce "team spirit." Many studios were highly structured, politically driven machines where argument was frowned upon and decisions were made by a small number of people. But the most common flaw in the industry at the time was its shortsighted nature—treating employees as temporary or easily replaced assets. Dev teams were often rebooted between projects, wiped before they ever established a rhythm or voice of their own. It was no wonder Blizzard retained its employees longer than other companies.

The first pass of class-based artificial intelligence being tested, July 2002. A group of kobolds following rules that dictated their behavior. The caster hangs back as the tank-kobolds run up to engage in a melee. They employed “unit collision,” code that prevented monsters from overlapping. It was used whenever many automated units were controlled by an AI, from games to films.

Similar avoidance code was used in *The Lord of the Rings* films for animating CGI armies. When the initial avoidance code was too strong, the armies displayed movement problems, prompting the press to report, “AI armies refuse to fight!” as if computers were too philosophically evolved for war. Image provided courtesy of Blizzard Entertainment, Inc.

July 2002:
A Modicum of Luster, A Pivotal Juncture

Polish was creeping into the build! A couple of emotes were working for humans, such as pointing and waving. Animations for weapon sheathing was new and became immediately popular with the team. Tim Truesdale's code supported different footprint sounds and added things like visible breath and snow particles for snow textures. More combat moves and visual effects had been added.

Wowedit functionality was finally robust enough to allow designers to change spells and ability parameters (i.e., movement speeds, stats, or direct damage attacks) without further programmer support. This major feature was called the ability editor (or spell editor), which encompassed every creature's attacks or abilities in the game. Because spells and combat were no longer hardcoded by programmers, designers could test things without programmers getting involved. This is a watershed moment in game development, when content creation lurches into overdrive. Designers were finally free to create their own monster and player abilities. Abilities, monsters, and combat were finally real.

With the editor mostly done, decision-making moments were at hand: Nine basic player classes had been resolved, yet not all races had the same class options. We were offering fewer options than most MMOs, but we didn't want our classes to play the same way or share identical roles, so we thought fewer character classes was the wiser choice.

We also set the plan for a self-imposed goal of a company-wide alpha test the following month. The exercise would define how the moment-to-moment of combat felt. The designers were confident that they would have many special combat moves implemented within the next few weeks.

Another improvement was sound. Sounds were fairly easy to implement and relatively unimportant in early demos (no one could hear anything at E3). Because the ability editor was working, sounds could be hooked up to spells and attacks. So far, ambient zone music, footsteps, and placeholder combat sounds were the only things audible, and it had been that way for years. Bit by bit, sounds would creep into the game as designers created places for both attack and impact effects to come into play.

Because of the impending alpha test, Eric and Kevin had been working on creating tables for items and spawns. Their door was shut with an "Ask Allen" sign taped to it (someone later helpfully scribbled a clarification: "for candy") so no one would interrupt their concentration. They were pushing hard to get as many abilities and items as possible for the company-wide alpha. Pressure was felt mostly by designers and programmers because the test was limited to the same three polished human newbie zones we had showed at E3.

Wolf riders, July 2002. Mounts were the latest feature in the game and their appearance was a surprise to anyone not working on the feature. Aside from cosmetics, the only functionality that mounts changed was a speed buff (and graceful jump animations), but they were a big hit with the team. Image provided courtesy of Blizzard Entertainment, Inc.

August 2002: Ingenuity with Cheats and Bugs

Warcraft III shipped, and for a short while, the company was in celebration mode. At the end of August, veteran employees received their five-year swords at an event held in a local theater after the company's quarterly show-and-tell. As the staff numbers grew, our company meetings were moved from the QA area to local theaters, and we saw whatever was playing, (often terrible movies like *xXx* or *S.W.A.T.*). Team 1 was splitting into two projects: the *Warcraft III* expansion and research for *StarCraft 2*. Blizzard North was busy making a soon-to-be-canceled game called "Dragons" as well as *Diablo III*. Nihilistic was getting ready for the announcement of *Ghost* at the Tokyo Game Show. WoW was showing major progress, and everyone in the company was looking forward to playing our alpha, which we had pushed back to the end of August because of bugs. The half-day sword ceremony was a precursor to the upcoming company-sponsored vacation in Las Vegas to celebrate *Warcraft III's* release.

From QA to HQ, everyone was being treated to a three-day vacation/wrap party, where the only company function was attending a performance by Cirque du Soleil. We took a six-hour bus ride, checked into our company-paid rooms, and had as much fun as we wanted. If employees saw one another, they hung out or just waved in passing. Poker was popular among designers and programmers, so we saw each other at the Texas Hold 'Em tables. (Many of the top *Magic: The Gathering* players were migrating to Texas Hold 'Em since the game was easier and good players could win much more than a box of trading cards.) Some groups booked large dinners at fancy restaurants. We blew off some steam that, admittedly, was probably tame by Vegas standards.

After the Vegas trip, team leader Mark Kern warned us to prepare for another mini-burn of late nights in which the whole team would work extra hours in order to avoid an overextended crunch time. He also announced the news that Team 1 and Team 2 were switching sides of the building next month in order to accommodate WoW's fifty-person development team. We had recently promoted two people, Alen Lapidis and Jim Chadwick, from downstairs (the QA and customer service departments) to the exterior team. After a two-year search, a pair of critical hires was found for the dungeon team—texture artists Jimmy Lo and Brian Morrisroe. Michael Backus was promoted from QA to become our first game master (GM), but since we didn't have any customers yet, Michael helped the world designers by placing monster spawns in finished areas. He later graduated from placing spawns to making quests. Several more GMs followed Michael's path by helping the WoW dev team with spawn placement and other world design tasks.

We reached a major psychological milestone when Shane Dabiri figured

out how to fake flying mounts. His hack involved using a cheat that switched the default player model with one that showed the character sitting astride a wind-rider (originally called a wyvern). Freeform flying wasn't a real thing in our game (and wouldn't be until our expansions), but the wind-riders' wings still flapped. Shane turned off gravity for his character, which meant if he jumped, he could move up six feet in the air without falling. After repeated jumps he was "airborne" and could run horizontally through the air. It wasn't true flying—he couldn't glide up or down—but while he "ran" above the buildings and treetops, his mount flapped its wings. It looked as though he were flying over the dwarven starter zones and through the lofts of Ironforge. Visually, it was stunning, and the team gathered around Shane's desk in the hallway in awe. We watched him "fly" from zone to zone. The world was beautiful from a bird's-eye view as we watched the buildings and treetops parallax below. The team became excited at the prospect of flying taxis. We speculated about turning airborne mounts into a 3D *Joust* mini-game. Everyone accepted that our engine and our world wasn't optimized to allow freely controlled airborne mounts, but we couldn't wait until zone-to-zone taxi rides could show off the landscape sweeping below the player. This "killer feature" would immediately make our game look "more epic" than competing MMOs.

Other departments also began contributing to WoW. Team 1 alpha testers were giving extensive feedback and ideas to improve the game. A designer at Blizzard North sent a prototype of an in-game collectible card game. This had been one of the earliest items on our wish list—a collectible card game within the *World of Warcraft*. It was never close to being implemented, but people played the paper version of the card game because, well, it was a game, and it was fun imagining the possibilities of rare cards dropping as loot from monsters. Some of the Blizzard employees were expert *Magic: The Gathering* players, and the first pass of the card game was impressive in its simplicity, even if the cards were unbalanced. Some of the more experienced card game players were Bo Bell (*Magic: The Gathering*'s first national champion) and Team 1 producer Frank Gilson (an international *Magic: The Gathering* Pro Tour player), and they both said the prototype was already better than two-thirds of commercially released collectible card games.

Our new interface was taking over the internal alpha test! Due to a particularly strange bug, “bag icon” artwork had replaced tomato bushes. Other bugs and oddities included a jinxed collision system; friendly demons populating the countryside; and NPCs being replaced by untextured basilisks who meandered about town as if they owned the place. Despite these visual aberrations, there were no server-side crashes and the game was an impressive first-time experience for employees in the alpha test. Image provided courtesy of Blizzard Entertainment, Inc.

Using a trick he learned from his days on Team 1, Collin Murray created a placeholder asset that appeared whenever art was missing. Using his first digital

camera, Collin took a clandestine picture of Shane Dabiri and silhouetted his face in Photoshop. He ninja'ed the cube into the next build. The team cracked up upon first seeing Shane-cubes on top of their characters' heads (in lieu of missing helmets). When flowers were missing, the hillsides were festooned with Shane-cubes. Cubes appeared wherever art was absent and sometimes filled the screen. The intent behind the joke was that Shane (the art producer) would be so annoyed he'd get the missing art bugs fixed.

Shane had deep roots at Blizzard. He'd made an impression on Allen Adham after discussing *Demon's Forge*, an early 1980s title Allen had worked on with industry legend Brian Fargo. Shane admitted it was the hardest game he'd ever bootlegged, and Allen guessed correctly how Shane had done it. Allen, whose game philosophy prioritized creating a friendly experience, admitted his early games were terribly punishing: If the player did anything wrong they were killed and forced to start over. I suppose that's how all great game designers start out—making painful games. Image provided courtesy of Blizzard Entertainment, Inc.

September 2002: Internal Alpha 1.0

Although late nights had started up again for the WoW team, productivity had slowed due to a company-wide addiction to the *Battlefield 1942* demo. No game since *EverQuest* was so popular, and probably no game had wider appeal to our team. After work ended around 10:00 p.m., most of the team stayed later to play the new FPS demo. The producers (who were also bombing co-workers) were hoping the obsession didn't become a problem with our schedule.

The happy news for the dungeon designers was the addition of Brian Morrisroe and Jimmy Lo, two much-needed texture artists for the interior department. As of September, Stormwind was the only textured city. Aaron was a fast 3D modeler, but even so it took him months to build cities. I jokingly consoled Aaron, Cameron, Dana, and Jose as they modeled-out their cities that they shouldn't worry about them being too big because no one was ever going to go in them. It was funny (to me) because there was some truth in it: None of us had any idea what gameplay was going into cities, especially since the quest-givers had recently relocated in the outside zones. The game designers only shrugged and reassured the four of them that there *would* be purpose to cities, such as the bank and trade skill shopkeepers (auction houses weren't yet part of the plan). Worse still was that everyone who went into Stormwind got lost because our mini-maps didn't support interiors, so most of the team gave Aaron feedback about how hard Stormwind was to navigate. He repeatedly explained it would be less confusing with the mini-map (maybe) and apologized. Despite the negative feedback, Aaron pushed forward on the shaky faith that the game designers would figure out cities later. Dana's Deadmines and Aaron's Scarlet Monastery were the only textured dungeons at this point, with the exception of two small goldmines. The five level designers and four texture artists were attempting to finish approximately fifty buildings, six cities, and sixteen dungeons (not counting the micro-dungeons) within a year.

Our team continued to grow. Michael Chu was promoted from QA to be an associate designer helping Pat Nagle and Jeff Kaplan with quest creation. Game masters were brought on board to help with spawn placement: Michael Backus was our first, followed by Andy Kirton and Steve Pierce, who were experienced GMs from Sony Online and Interplay, respectively. The increased size of the team had affected the social dynamics, as departments started to stick together instead of mixing over lunch. Dinner during late nights was becoming the only time the team got together. Most people sat on the rickety hallway chairs (or the floor, if chairs were unavailable) and talked over pizza and soda, while others retreated to their offices to work and eat.

Meetings with so many people were cumbersome, so there was less interactivity between different disciplines. Since there were more designers on the team, non-designers were participating less frequently in design discussions, and while this was good for productivity, a natural social separation grew between departments. The team hired a new UI designer, Derek Sakamoto, who would be working with web programmer Jesse Blomberg to add interactive functionality to the game and its website. Our guild features were recently implemented by Jeremy Wood, who tested his new code with interior level designers Cameron, Dana, Jose, and Aaron by making them officers and allowing them to invite and promote other players. It was a lackluster test because there wasn't very much to do other than using guild-chat to chat about the guild-chat feature—which wasn't a very exciting discussion—but that *was* the first WoW guild-chat conversation, nevertheless. And what was the first WoW guild christened? "Assmaster." Jeremy reused the name Assmaster as the first team arena name, too. The moniker foreshadowed the level of sophistication the game would soon enjoy. Whenever fans are given a modicum of creative control in a computer game, they fill it with penises and profanity, and developers aren't any better. The only potty humor I know of that made it into the game was what the level designers called "poodads." Dana Jan created a pile of dung and adorned it with some buzzing flies he'd taken from another doodad of rotting meat. The rest of us encouraged Dana to ninja it into a dark corner of the Loch Modan ogre mounds as our own silly secret. We cackled with glee when we saw it in the daily build and called over Bill Petras to check it out. He laughed, shook his head, and asked us to remove it. We said we would (but didn't), but I'm pretty sure it's gone by now (possibly flushed away by Cataclysm floods).

Log-in placeholder screen, September 2002. Players will likely never see what developers looked at for years. Things like sounds, menu artwork, and buttons were among the easiest parts of game development, so they were often created at the last minute. Image provided courtesy of Blizzard Entertainment, Inc.

Internal skepticism of our game's potential (yes, there were doubters) ended with the company-wide alpha test. It was fair to say that Blizzard as a whole believed WoW would be a very compelling game. Elwynn was enough to keep the company preoccupied for a week, and there wasn't even content in Stormwind yet (unless getting lost counted as gameplay). A few brave souls ventured into Westfall, but the loot tables weren't completed, so killing higher-level monsters didn't provide rewards. Two workdays and a weekend were devoted to playing WoW and not a single server crash had occurred.

The most notable behavior was ninja looting. Anyone could loot any corpse, which meant melee players got everything. Rogues decloaked to loot monsters that others had killed. It was a frustrating way to play, so everyone's goal was to increase their character's level so they could leave the congested Northshire Abbey area and play solo. This was a perfect example of one oversight muddying the entire gameplay experience, so most of the feedback of playing with other people was a bit spoiled. Nevertheless, Allen Adham received helpful input from employees and wrote a rallying email about the test:

The early response has been terrific. Apart from a few polish issues, a bit of kill stealing and a whole lot of ninja looting, everyone seems to be having a blast. Here are a few noteworthy points:

We peaked at 61 users on Friday (an all-time high)

There were still around a dozen people playing when I left at 10-ish.

As of 10pm there were at least six people from Team 1 devoting their Friday evening to playing WoW. “Couldn’t tear myself away.”

Josh, Matt, Adam, and a few others continued playing till 2am-ish.

When thinking of what to play over the weekend, at least a dozen people decided they would rather come in and play WoW than anything else available on the market today.

Dave Berggren gets choked up when discussing how much he likes the game. “Gushing” with how impressed he is. In fact, he went home and canceled both of his EQ accounts on Saturday. Yup, that’s two level 60 characters flushed because of WoW. :) Let the tally begin!

I heard countless times “This game is soooo good looking.”

I heard countless times “I am really having fun” in a slightly surprised tone of voice.

I have been asked around a dozen times “When can we start playing from home?” in a hopeful, puppy-dog voice.

Artist and *EverQuest* veteran Roman Kenney was well-known for being the

most creative exploit-finder in the company. When game designers blocked off unplayable zones with killer mobs, Roman figured out ways past them. For instance, he once performed an action that caused his character to dismount from a flying taxi, dropping him from the flightpath into an off-limits, high-level zone below. His hijinks didn't stop there. After retrieving his corpse (he died from falling damage) in the forbidden area, he found partially implemented vendors who sold weapons that were better than what was available in the newbie zone loot tables. He clicked on the high-level weapons, linking the stats in world-chat, and asked if anyone wanted to buy them. People enthusiastically made offers thinking he had looted them off mobs. He purchased the weapons from the vendor and resold them for a huge profit. The game designers were amused at his ingenuity, even if it sullied the game's economy, so they quickly removed dismount actions from our flying taxis to prevent further such excursions. Another "grief" Roman found was killing AFK (away from keyboard) players by building campfires at their feet. People returned to the game to find their character dead in what was supposed to a safe area. Roman's trick convinced game designer Eric Dodds that player-created campfires shouldn't do damage. Eric found this especially amusing, as he was fond of pointing out that fires only damaged players because they *hated* them (players were considered an "enemy" on campfire reputation lists).

Every few weeks, the internal alpha test was updated with features. Designers were cramming data into the game, such as configuring abilities, items, and quests. The most common request was for more quests and items. Items were particularly difficult to create because their values needed to change, individually and by hand, every time combat was tweaked—and combat was tweaked almost daily. Spawn placement had been improved and all the old monster-spawns were redone by our recently promoted spawn team.

Allen Adham gave monsters 33 percent fewer hit points to speed up leveling and reworked all classes on an enormous Excel spreadsheet that tracked the stats. Many game designers enjoy the purity of spreadsheets, and Allen was no exception. Allen would stare at those spreadsheets all day long, patiently tweaking the values until things looked right. The spreadsheet he'd create for WoW allowed him to compare, assess, and change stats on a level-by-level basis. It showed the amount of experience and gold was given by a fifth-level monster and showed how much experience must be acquired for a character to reach level ten. Allen knew the average rogue did 70 percent more damage than a warrior. If high-level clerics were too weak in combat, the spreadsheet would show it, even before it was tested in-game. The same was true about items. Through this master spreadsheet, every level for every class had been and would continue to be rebalanced until the game shipped.

As the team continued to work late nights twice a week, the third phase of alpha testing was on schedule for mid-October. New classes and abilities were

added along with the newest zone, Coldridge Valley (originally named Anvilmar), and dwarves became the second player race with their own starter zone. Reports from Blizzard North and Team 1 stated both teams were still engrossed in the alpha, and it was great to hear players weren't exhausting themselves on our content too quickly.

October 2002: Still Unanswered Questions

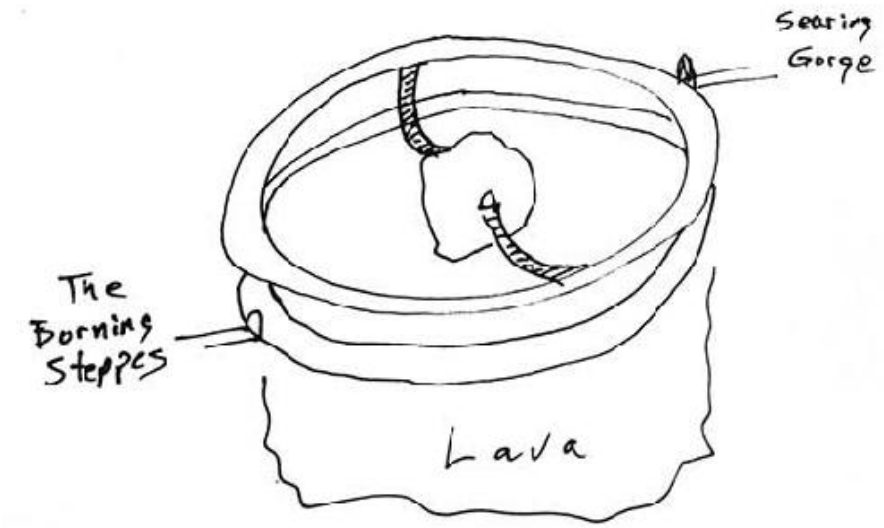
More delays loomed on the horizon for dungeons. The pathing code looked as though it might need to be rewritten from scratch again, as Scott Hartin wasn't happy with monster navigation. Suboptimal AI pathing would allow *cheeses* (exploits), in dungeons. If players could find a way to attack monsters without taking damage, they could repeat it for free loot and experience. This could harm the integrity of the economy and turn character leveling into a series of repetitious exploits. So the stakes were high for preventing exploitable AI. Pathing code that minimized these immunity spots was the best remedy.

If there is a place where players can exploit gaining experience, items, currency, or reputation, then that's precisely what players will do, because they always take the path of least resistance. Since MMO content is measured in months, not hours, the content is paradoxically daunting, so any shortcut to the top will become the most popular route, even if it isn't fun. And if a game's path of least resistance isn't fun, it means the game isn't fun. Lazy or inexperienced game developers blame players for "ruining" a game with aberrant behavior, but these accusations are like dog owners blaming their pets for eating unhealthy scraps.

Delays in pathing code meant delays in testing dungeons, which also meant game designers still couldn't give level designers better answers regarding how to build dungeons. Lack of direction for dungeons was troubling since the rest of the dev team was seeing a little light at the end of the tunnel: In seven months, we were planning for a friends-and-family alpha that was only a few steps closer to the game going public.

I'd enjoyed a small measure of artistic success with Blackrock Mountain. My first dungeons using 3D Studio Max were (in order) the Wailing Caverns, Ahn'Qiraj Temple, and the Razorfen dungeons. I had mixed feelings about them (and downright didn't like Ahn'Qiraj, whose awkward play spaces made for uneven gameplay). But I finally could set my sights on architecture on a grand scale with Blackrock Mountain. Exterior level designer Matt Sanders apologized for not evening out the elevations of the zones around it, but I thanked him for not doing so. I thought big areas were more interesting when they weren't flat, and since there wasn't any gameplay in BRM, we could indulge in dramatic elevation changes. Carlo Arellano (who created the concepts for Blackrock's epic doors) suggested putting a giant dwarf statue in the center. I liked the suggestion but used them instead to anchor the giant chains players used to cross the cavern. I stole Cameron Lamprecht's dwarven buildings and shoved them into the wall to achieve the effect of a city. After a month of modeling, I handed the wireframe over to Brian Morrisroe, who proceeded to paint dozens of textures for it, almost as many as my previous

dungeons combined. I put Brian's textures to good use by dedicating the next seven months to building three Blackrock dungeons.



Blackrock Mountain layout, January 2002. This original design called for two ringed platforms and two bridges connecting to a suspended chunk of rock, in which was the entrance to a dungeon. I economized the elements by collapsing and tilting the platforms and repurposing the chains as bridges. "Players would feel like they were sneaking into areas they weren't supposed to go," I explained to a dubious Bill Petras. He was worried players wouldn't know how to find the dungeon until game designer Jeff Kaplan allayed his concerns.

Because of the impending friends-and-family alpha test, Mark Kern announced that another crunch time would be upon us in February and March in order to be ready. Crunch time was harder than late hours. It meant working until 10:00 p.m. or midnight four times a week instead of two. Employees were asked to limit both Thanksgiving and Christmas vacations and to avoid taking time off for the next seven months. Team-wide email reminders about getting to work on time (before 9:30) were becoming regular, morning absences were making it hard to schedule meetings, and tardiness arguably defeated the purpose of staying late.

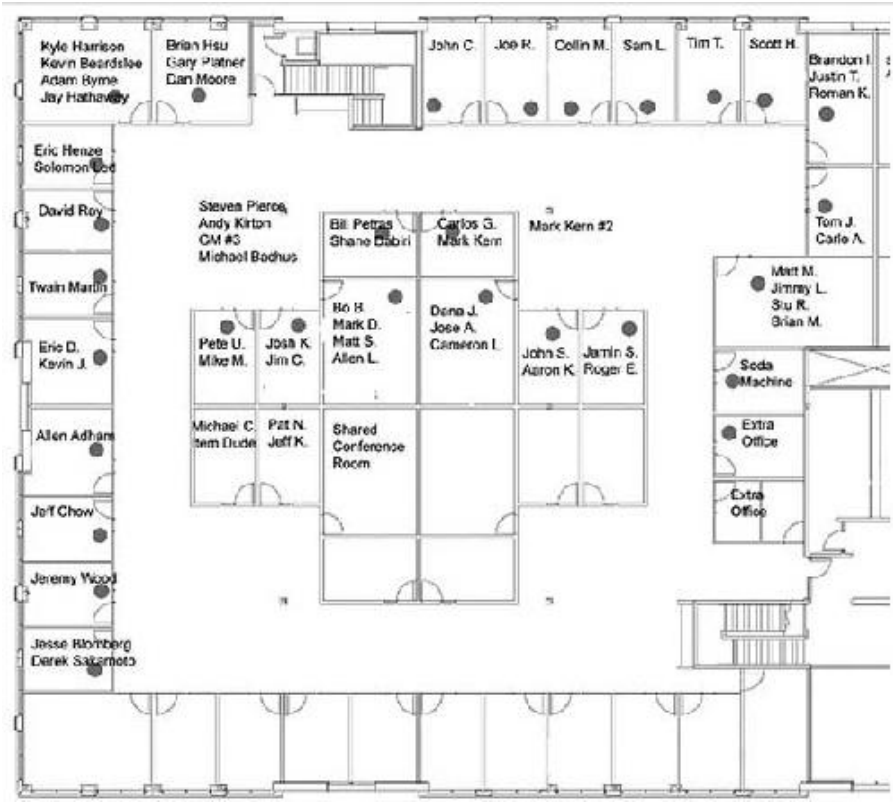
Producers had gotten into the practice of saying, "We're not going to do that…yet" when asked if we were planning to implement various features. It was a soft way of saying no to features and tools the team wanted in order to prevent feature-creep from bloating the programming workload and ruining our schedule.

There were still too many unresolved issues in the game. It was now being questioned how many dungeons could make the 2003 year-end deadline, and no one knew the answer. The sign "Go Ask Allen (for candy)" still hung on the door of the game designers' office, but now Allen's door was

adorned with one that said "I'm busy, go ask Kevin and Eric." While Allen Adham had decided to remain as a full-time design lead, Kevin and Eric had many pressing issues they needed to resolve, and they kept track of the Allen Topics on the wipe board hanging in their office. The September–October list included: secondary skills; underwater combat; tattoos; trade skills; how many pocket neighborhoods in Stormwind; missile weapons work again; gallows in Stormwind; debuff icons; equipped items (effects and animations); racial special abilities; system changes to buffs (temporary beneficial spells); battle music; sixth school of magic; rituals; and taxi, bank, and world-map user interface. One of the more amusing ideas was an "Australia server" for all the abusive and law-breaking players: Instead of canceling their account and losing customers, we would sentence offensive players to an exile server unsupported by the GM staff.

While Eric and Kevin vigilantly used every opportunity to discuss game issues with Allen, Allen regularly went to lunch with Rob Pardo, Jeff Kaplan, and a gameplay programmer on Team 1 named Bob Fitch. Over the cheapest fast food they could find, they discussed MMO systems and philosophies and what could be learned from *EverQuest*. These lunchtime discussions were *highly* influential to the ultimate shape and philosophy of the game, and with *Warcraft III* out the door, Rob Pardo devoted more of his time to working on WoW's various game design ideas.

While the designer's whiteboards were filled with Allen Topics, the quest designers had filled theirs with timelines of Warcraft history. This was the result of brainstorming sessions with Chris Metzen to organize and explain his stories in order to begin work on lifequests—which were overarching stories players experienced as they leveled up. Since humans were the most finished race, their timeline needed sorting out first. Soon after work began on lifequests, they were put on hold after it was learned the *Warcraft III* expansion might change the lore timeline again.



Layout of Team 2, October 2002. Team 2 had expanded to more office space, but eventually the GM staff would become larger than the development team itself and would occupy the floor below. Images provided courtesy of Blizzard Entertainment, Inc.

At the next internal Blizzard show-and-tell, the company got to see a newly prototyped game: a futuristic version of *Diablo* that Blizzard North jokingly called "StarBlo," as well as preliminary art for *Diablo III* and the latest enhancements in WoW. We showed off the orc city, a long list of emotes, and various pet commands that were new to the game. We demonstrated the new functionality of how quests could be initiated by items in the player's inventory or by objects embedded in the world. A couple of new zones—the Wetlands and the Swamp of Sorrows—were also finished. Rabbits and chickens were the latest critters, and everyone loved watching wolves attack them. The concept of monsters fighting other monsters was new and everyone laughed at the antics.

"The World of Warcraft: our promise to you is a bear under every tree!"

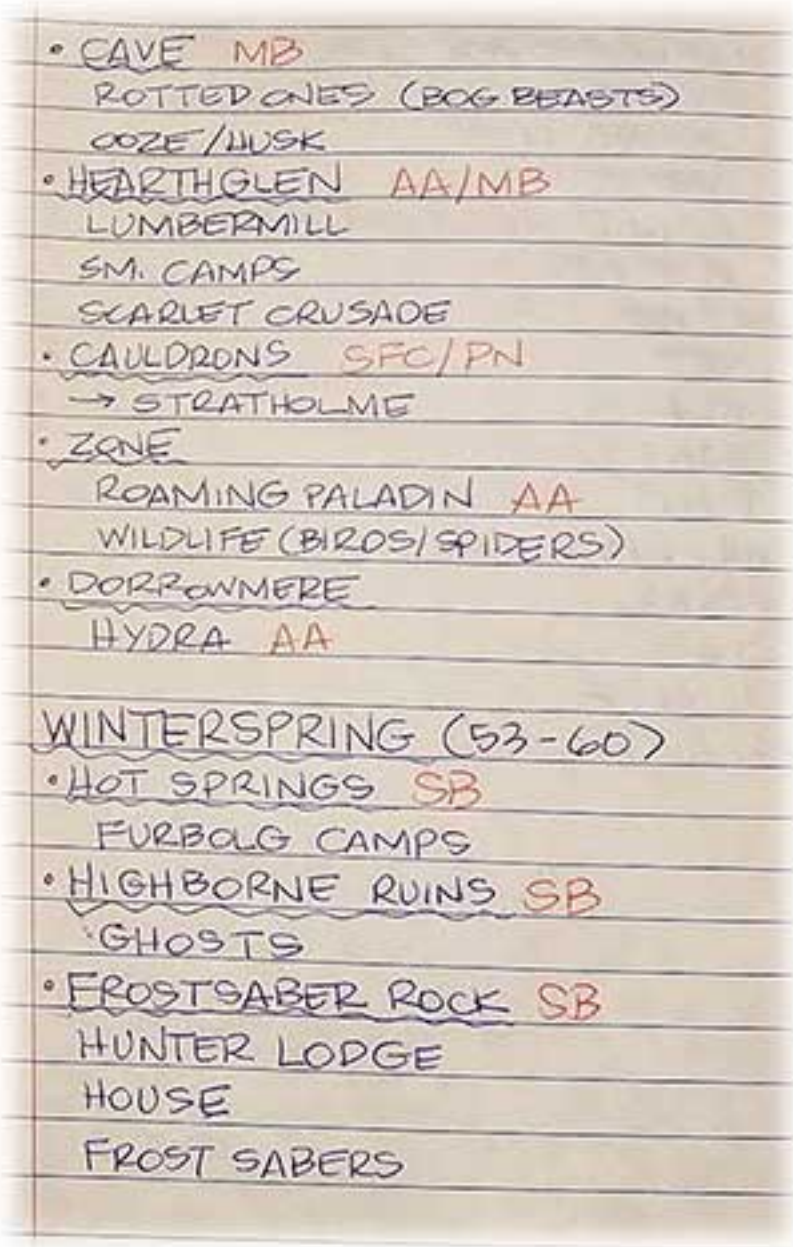
— Spawner Steven Pierce, joking about overused creatures

The concept of hunting wildlife wasn't always a given. Before combat was tested, designers wondered if they wanted to reward players for killing animals. Originally, ambient life was intended to be only zone flavor, to give the countryside movement. Alas, with a limited asset budget, designers used what models were available to maximize variety. From condors to tigers, even endangered species made it onto the "hit list," albeit in deviate forms—wolves became dire wolves, and so forth.

Quests

Since WoW was Blizzard's first game in which the players were the protagonists, it was left to the quest designers to breathe stories and character into the world. Originally, the main purpose of quests was to "breadcrumb" players through new zones so that they familiarized themselves with its areas, thereby reducing the danger of getting lost. But early testing backfired on those intentions. Training players to depend on their quest logs to navigate disoriented them when their quest logs were empty! Designers assumed players would only clear quests to familiarize themselves with a zone, then grind monsters until they reached the appropriate level to move on. Instead of grinding zones for experience, players left prematurely in order to reload their quest log! This meant players sought content in areas far too difficult for them. The only way to keep players in the appropriate zones was adding far more quests than originally planned. By creating so many quests, WoW had *accidentally* created compelling solo content, which arguably became the game's strongest ingredient for success with the broad market of casual players. Providing that much enjoyable solo content was never planned, budgeted, or even prioritized—it was stumbled upon: *By trying to solve a navigation problem, we'd inadvertently engaged a larger audience, namely the solo players*.

Another misconception the designers had about quests was that level-forty players would enjoy cross-continent quests atop their new mounts. As it turned out, travel time was downtime, so designers settled on short-range quests around hubs. Jeff Kaplan once laughingly admitted to the quest crew, "Remember when I said it would be cool to send people on epic journeys across the continent? Um, forget I said that. That's not going to work. Having a few of them in the game is okay, but we basically don't want to do that anymore."



Lore meeting notes by Susanne Brownell. After an exterior zone was landscaped and spawned, Chris Metzen gave the quest designers a 40-minute rundown of the lore—where the battles took place, who lived there, and why they didn't like their neighbors. After drawing a map on the wall, the quest designers would pick, in a round-robin fashion, which point-of-interest (POI) they wanted to write quests for. After a week of conceptualizing quests they emailed ideas and names to Chris, who almost always gave approval. Image provided courtesy of Blizzard Entertainment, Inc.

MB — Michael Backus

AA — Alex Afrasiabi
PN — Pat Nagle
SB — Suzi Brownell
SFC — Shawn Carnes

Having quest designers at all was a surprise to the producers, who had expected quests to be easy to make. The producers themselves had planned to do them in their spare time—which was a laughable plan in hindsight. Once they learned all the work involved to make even the simplest quest, they quickly got upper management to get more money to hire full-time quest designers. Aside from Jeff Kaplan and Alex Afrasiabi, who were popular *EverQuest* pundits, the only other external hire to the quest team was Shawn Carnes, who had come from Wizards of the Coast. The rest of the quest designers were internal hires from technical support or QA. Pat Nagle, our first quest designer (after whom Eric Dodds named the famous NPC fishing trainer Nat Pagle), was followed by Michael Backus, Michael Chu, and Suzi Brownell. Over half a dozen designers were hired to do what we had originally thought could be accomplished by the producers in their spare time. If we'd only wanted kill-quests, we might have been able to get away with one or two devs, because they only took a couple of hours at most to create. But the prevailing opinion of the team was that kill-quests weren't very engaging and felt cheap. As more quest designers were added to our roster, they naturally pushed the envelope to see how far off they could stray from the beaten path of simple collection quests. Luckily for the players, there was modest one-upmanship among designers to employ the most original game mechanics, and it was this personal drive, and not a supervised mandate, that made the WoW quests so creative and varied.

After a quest was "concepted," the task became to script it into reality, and that required an almost global understanding of wowedit. Quests designers need to know everything about creating creatures, abilities, behavior, items, and objects. Pat Nagle, the first quest designer, usually mentored newbies to wowedit. Quest designers knew so much about the editor that Carlos Guerro, the producer in charge of content, often went to them to quickly ninja-fix bugs that belonged to other departments. By navigating through wowedit's dialog boxes, quest designers defined the multitude of parameters governing each quest, some of which were far more complex than others. Giving players objects that triggered new game mechanics allowed quest designers to create a wider range of gameplay possibilities. They also discovered interesting mini-games and mechanics that were later incorporated into boss fights. More than anyone else on the team, it was the quest designers who pushed the boundaries of what our game could accomplish. If some of their inventions were a bit hacky (sometimes incredibly hacky), it was a small price to pay for fun.

Quest creation, October 2002. This dialog box was the first in a series used to define the many parameters of a quest. Image provided courtesy of Blizzard Entertainment, Inc.

Quest testing, October 2003. Testing and debugging quests was the most time-consuming part of quest creation. In this shot, Jeff Kaplan tests a multi-part quest by talking to every NPC in a quest line. When it finally worked he relocated the NPCs into the world for in-game play-testing. Image provided courtesy of Blizzard Entertainment, Inc.

The WoW quest system, like talents, evolved from a very basic idea into a robust feature that offered a wide variety of play experiences. This happened not by design, but rather from the simple fact that quest designers had total access to all the design tools. Quest design was probably the most creative role on the team, not only in creating temporary game mechanics, but in lore and writing. The bulk of scripting time was spent banging on a quest to get it to work without bugs and testing it until designers were satisfied it couldn't be broken or exploited. Once the they were happy, they committed it to the next daily build, and the quest would be playable. A designer averaged a couple of quests per day (which greatly depended on the quest's degree of complexity), so a zone with thirty quests took about three weeks to complete. One of the most complicated quests was Pat Nagle's chess event at the top of Karazhan, which took many *weeks* to implement and debug.

As long as the quest designer's mini-stories fit into the feel of the zone, they worked in relative autonomy—Carlos Guerro, the content producer, was very hands-off in managing them. As long as they made their deadlines and didn't create work for the rest of the art team, management was happy. Like everyone, quest designers waited for new features or art assets to integrate into their work, but otherwise they used whatever was already available.

Suzi Brownell often used empty buildings to serve as elements in her quest design backstories. She sometimes went to the level designers (who were always happy to help) to add support structures or props to flesh out an area. For example, Matt Sanders enlarged an area in Felwood to accommodate a quest wherein a kitten would turn into a tiger after drinking corrupted water.

One of the metagames quest designers were able to play involved adding references into the narrative, like personal Easter eggs. Fans have compiled exhaustive lists of popular culture references, but these have only scratched the surface. NPC names were often inside jokes and personal reference ranging from pets and old college roommates, to obscure literary characters. Unless asked, quest designers rarely told anyone the origins of their character names.

The quest designers are fond of their bunnies. Because "critter_bunny" sorted at the top of alphabetically listed creatures, bunnies became the most easily accessible target for spells. There are millions of invisible bunnies in *World of Warcraft*. If a monster lobbed lightning bolts at a specific location, chances were they were targeting invisible rabbits. Quest designers and monster scripters used them as the default target for just about everything from the depths of the Molten Core to the holiday events in Stormwind.

November 2002: Internal Alpha 2.0

Thankfully, the team's unbridled, uninterrupted enthusiasm for *Battlefield 1942* had finally taken a backseat to playing the second internal alpha of WoW, which had progressed from being fun to downright addictive. Team 1 members, who were supposed to be busy on *StarCraft II* and the first *Warcraft III* expansion, received emails warning them not to play our alpha during business hours. Blizzard North congratulated us on giving the game a sense of awe and wonder. Allen Adham had culled emails from company testers (over a hundred pages' worth) and remarked how many good ideas and criticisms he had received. As with every Blizzard game, nothing was taken for granted or written in stone: How people played and communicated, the loot interactions, the interface, and moment-to-moment experience were all heavily scrutinized. It was a successful testing. A few bugs and crashes were identified and fixed, and all the feedback helped to make the game stronger.

The first alpha had ended around the tenth level; the second waned at twentieth and included a host of new features. There were over two hundred quests and fifteen hundred items, all classes and their abilities were playable (up to the twentieth level), and a new trade skill interface was implemented. Players received spells from class trainers instead of merchants and could summon and control pets. Monster health, armor, and damage had been reduced by a third to make leveling faster, but the monsters also got smart: They could now cast spells and call for help, and they dodged, evaded, and blocked attacks. Elwynn, Westfall, Redridge, Duskwood, Stranglethorn, Deadmines, and Swamp of Sorrows were spawned, quested, and *itemized* (meaning there were monsters, quests, and loot). Many areas were still empty and the loot tables weren't balanced, but seven zones (out of forty) were far along. Pathing code was in the middle of another ongoing overhaul, so in some areas creatures wouldn't move. Air taxis were implemented in our first three zones: Westfall, Elwynn, and Redridge. When someone became 75 percent submerged in water, their character now showed a swimming animation in lieu of standing or running.

Yet another iteration of the user interface, October 2002. The paper doll has been shrunk and player information has been condensed and moved to the side, so it no longer covers up the in-game character. The presence of an experience bar was debated, since we wanted the player to have fun without focusing too much on leveling. Image provided courtesy of Blizzard Entertainment, Inc.

While the designers scrambled to tweak the alpha, other departments were adding features. Instance functionality was finished and would soon be tested. Tim Truesdale was taking another pass at water and lava flows and had added controls to wowedit that allowed exterior level designers to adjust the direction of water current and the height and placement of rivers. Meanwhile, our network programmers were brainstorming security precautions that would allow employees to play WoW from home.

The art team had a few new outside projects. Justin Thavirat was pulled off WoW to work on another cover for the *Warcraft III* expansion. Roman Kenney and Carlo Arellano were helping Team 1 with concept work for the naga (devs occasionally cross-pollinated other teams, including the cinematics department) because the naga were to appear in Team 1's *Warcraft III* expansion before WoW. The hope was that one of the artists could give the naga a body type suitable for componented, wearable armor (something all player races needed); however, it was looking like it wasn't meant to be. The nagas' non-humanoid body types wouldn't accommodate either customizable armor or common player animations. As no one on the team could figure out how to solve these two limitations, the naga remained monsters.

Meanwhile, Brandon Idol, the artist primarily in charge of character designs, was creating variations of skins and was busy creating new female hairstyles. The salon hairstyles helped distinguish humans from the other races, who might have more unkempt, tribal, or punky looks.

The level designers and texture artists had stopped working on cities. Without mini-map support, Stormwind was too disorienting and no one could find anything. Play-testers hated going in it because they couldn't easily find their way out. The game designers were also concerned Stormwind was too big, so production on the other cities was halted until play-testers could give feedback after navigational features were implemented. This didn't include Booty Bay (originally named Blackwater Cove), which was being textured by Jimmy Lo. Jimmy had immediately adapted to the color-saturated WoW painting style that was taking other artists weeks and sometimes months to master; we couldn't believe he'd come to us straight out of school. Aaron Keller stopped working on cities and began building Shadowfang, for which our other new texture artist, Brian Morrisroe, was painting textures. Aaron, who had worked with him at another company, recognized the small rocks Brian painted into his floors (they added dimension and variation to the ground). "Dude, those are the patented Morrisroe rocks!" Aaron cried out. "I'd recognize them anywhere!" Having Brian and Jimmy paint textures for the dungeon team was a huge relief because they fulfilled the project's last major personnel need.

Fake skylines in WoW—before and after, November 2002. Before Scott Hartin implemented a new level-of-detail system for the mountains, it took too many triangles to draw distant landscapes, so the game's frame rate dropped if players saw the horizon. Scott's code created a low-resolution skyline (based on terrain topography) whose silhouette seamlessly blended into the horizon fog, creating much-needed landmarks that improved orientation in wide-open spaces, such as Westfall. Images provided courtesy of Blizzard Entertainment, Inc.

December 2002: Blizzard Looks to Asia

During the slow month of December, programmer Sam Lantinga finished making our user interface customizable via a lightweight programming language called Lua. Despite the fact Sam had explained it to the artists a number of times, the concept of a user-controlled interface didn't make sense, but the designers and programmers assured us it would be great. Most of us couldn't understand what was so wrong with the default interface that we now wanted to turn control of it over to the general public. Why let users control the interface? How much better could they make it? Wasn't it clean enough?

The game designers took advantage of the quiet month and tweaked combat formulas and created new spells. They also dusted off old ideas and held meetings about them as discussions moved from the abstract to implementation feasibility (95 percent of them were scrapped, usually because they required extra code or art). There still weren't any player-versus-player meetings, but that didn't prevent spontaneous discussions in the hallway. Like instanced dungeons, PvP was a highly debated topic, and designers who got caught up in the discussions looked as though they'd rather be somewhere else. I think the main problem with PvP was that there were many good ways to implement consensual player conflict and everyone wanted to try their idea first.

While the team enjoyed Scott Hartin's new horizon geometry for skylines, the animators worked on visual effects (spells) and animated the last player race, the Scourge (sorry, Chris, but we were still calling the undead "the Scourge"). Tim Truesdale's new eye candy for the game was specular highlighting. Instead of using a resource-demanding technique (called bump mapping), Tim used an inexpensive shine that distinguished rough and smooth surfaces, giving some depth to the ground textures. Many artists were worried that the realism wouldn't fit well with the rest of the game's illustrative, painterly look. But Brandon Idol used it in a few tests zones and the finicky artists liked his subtle application of the new effect, mostly because it wasn't overdone (as it was in other games). This conservative approach was a classic example of Blizzard's caution with innovation: While other games jumped on the specular highlighting bandwagon to make everything appear shiny, metallic, and "next gen-looking," we used it sparingly. The producers were concerned that reworking the ground textures would bloat the schedule, so while specular highlighting was approved, it was put on the back burner. The result of this executive decision was that Brandon did it anyway, during weekends.

The ground floor (beneath the Team 2 office space) was under construction. The dotcom company moved out of our building and Blizzard

was renovating it for the imminent GM and support staff. It was unsettling that over a hundred people would be hired to support the game, because it meant delays to shipping the game could get very expensive and it put more pressure on us. As we worked on WoW, we listened to drilling and sawing downstairs. It was another reminder of how the company was preparing to grow after our 2003 launch.

Image provided courtesy of Blizzard Entertainment, Inc.

We wrapped up the year 2002 with a team meeting in the "food area," which was an open space in the hall with conference tables. The hallway tables were the only available space in the Team 2 area for dinner, and this was the main reason there were so many stains on the carpeting. We had just finished eating pasta and pizza when Mark Kern told the team Blizzard was looking to change the business model for WoW. He explained that we had been the only American developer to successfully reach the Korean market (with *StarCraft* and *Diablo II*), and no one in the company knew why. Two years ago, Blizzard management hired a two-person team to study the Asian market; both were experienced in business and games, that their extensive analysis (two hundred slides' worth) was encouraging enough to convince Blizzard to delay WoW's release in order to simultaneously launch WoW in both the Korean and American markets. Korea's statistics alone were enough to draw Blizzard's attention—half of their homes had broadband access and one-third of all Koreans were gamers. Also, MMOs were extremely popular there. Korea had over sixty active MMOs charging as much as twenty dollars per month. But most American companies couldn't penetrate this market, and we wanted to know why.

While Korea seemed inviting, China looked intimidating. The government insisted that everything relating to a game's production and distribution had to be done in China or face a heavy import fee. Chinese

officials didn't pursue piracy of foreign software, only domestic. Estimates showed there were as many as eight million illegal copies of *Diablo II* and that two million pirated copies of *Warcraft III* were sold immediately after the game shipped. Internet cafés were forced to use the nationally policed Internet service providers; if someone visited unauthorized websites (depicting violence, Western news, or anything deemed illegal) both the café owner and the perpetrator could be arrested. On top of that, the Chinese government reserved the right to shut down (for any reason) game servers, which had to be located in China. Furthermore, any depictions of exposed bones or references to skeletons had to be removed to avoid insulting the Chinese reverence of their ancestors. (Many years later I heard through the grapevine that the bone censorship was only the result of competitors attempting to slow down WoW's implementation in China. But we didn't know any better at the time, so we jumped through the hoops to remove all bones from the Chinese version of our games.)

The report from our Asian consultants explained that American games weren't successful because Asians resented being treated like a secondhand market—especially since their game culture was so much stronger and more mainstream. American companies rarely did beta tests, interviews, and previews in the East, and servers were rarely located in Asia.

Besides the language barrier, Western MMOs would need a support staff who spoke Asian languages. And the Eastern gaming industry had a more advanced business model: The boxed game was free, and people paid to play via their phone bills. Their accounts were tracked not through credit cards, but rather through their national identity number (the equivalent of a social security number). There were legal considerations too. Gore and violence were commonly prohibited, and non-consensual PvP games received "adult-only" ratings. In Korea, real-life policemen responded to griefing, and since representative storefronts were required by law, players would fly across the country to stand in line to complain to a game's representative in person. In China, public concerns over hacking had ignited vandalism and even protests outside developers' headquarters. So offering WoW in Asia required much more than simply tossing our hat into the ring and hoping for the best.

The report also showed high expectations for WoW, although many Asians were dubious of our game's system requirements. It seemed they shared the same skepticism as the journalists at E3—no one believed low-end systems could run our game. Little did they know that even antiquated TNT2 video cards actually could run it, and with an acceptable frame rate. We imagined that by the time we shipped, customers would have even better video cards.

Mark explained that since we knew the global market better, we would spend the next few months with our Asian consultants to develop a new business plan for unrolling WoW. This would involve a planned beta for Korea (at least) and partnering with another game company to handle non-

English customers. We also needed to implement software localization for GM tools, billing, and account tracking software. The culmination of the news resulted in Mark officially pushing back WoW's shipping goal from late 2003 to the beginning of 2004. We needed those extra few months to finish the game anyway, so no one was too surprised. A bunch of us (myself included) even suspected we'd ship in 2005.

After the meeting I asked Mark if he was getting stressed out preparing for our launch. He smiled tiredly and asked me if I realized what was at stake. "Fans have been burned by MMOs so many times there's a stink associated with these types of games," he explained. "And there are only so many people willing to pay a monthly fee. We *cannot* risk having bad press because of a poor launch, that's the one thing we'll spend whatever it takes to avoid. If we can distinguish ourselves with server stability it will be our best chance at enticing casual players to try a subscription-based game."

January 2003: MMO Miasma

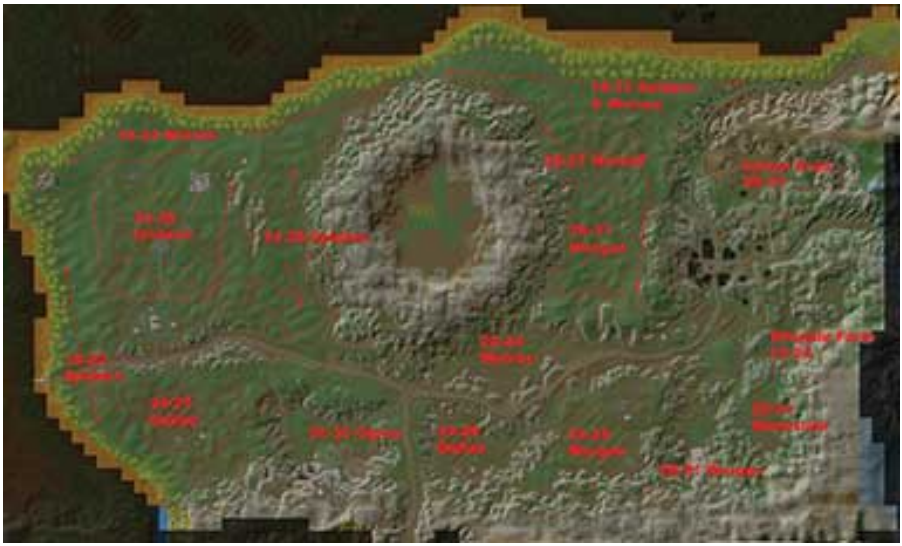
After three weeks of mid-week holidays, parties, and vacations, the team reestablished its rhythm of development, though it was fair to say everyone was getting tired of working on the game. There was still very little PR about the project and our confidentiality was taking its toll—it felt as if WoW wasn't part of the MMO race and we weren't getting anything done. This was partly due to the sheer scope of the project. More things were added to the to-do list than were being removed, so it felt as if we were running on ice. On top of our internal concerns, it wasn't a good month for MMOs. Spirits were dampened by the poor sales of the *Sims Online* followed by uncomplimentary screenshots of *Star Wars Galaxies*. *Sims Online* had promised to attract new customers to the online pay-to-play model, but the lackluster response indicated a broad market rejection of subscription-based games. The stink of the MMO bubble was getting so strong we were seriously concerned it would dissuade many from trying our own product. To generate some excitement for the group, the producers decided to release another gameplay movie showing off what we had accomplished so far. We were still not showcasing our major features such as our interface, gryphon riders, or cities, but a couple of new zones and indications of PvP would hopefully remind the public of our efforts.

January wasn't an official month for late nights, although many Team 2 employees still voluntarily worked sixty to a hundred hours a week since we were used to working late. We spent so much time with one another (both during and after work) that Orange County restaurants were accustomed to seating groups of people wearing Blizzard T-shirts. (The older Blizzard T-shirts were cooler because it meant you were more of a veteran.) Waiters familiar with our games asked if we worked sixteen-hour days or what project we were part of. Often they told us they liked our games or rambled on about their *Diablo* character.

Battlefield 1942 creeps into *World of Warcraft*, January 2003. Kyle Harrison replaced his character's body with that of a dwarven steam tank. Kyle's character appeared and moved as a tank; he even cast a fireball to fake the effect of his "vehicle" shooting. He could also make the tank jump and strafe. Unsanctioned tests like these got the team to rally behind ideas or features. Because we were such fans of *Battlefield 1942*, this one in particular got everyone's imaginations fired up about what could be done with vehicles. Image provided courtesy of Blizzard Entertainment, Inc.

The spawners—Mike Backus, Geoff Goodman, Andy Kirton, Josh Kurtz, and Steve Pierce—were taking a break to try out player-versus-player interaction. PvP combat was in its basic form—a person typed out a cheat command in the game's console to put other players on their hate list, which simply meant they could attack one another. It'd been a long while since people toyed with PvP, and the reason its functionality had been turned on again was to allow art producer Shane Dabiri to film the second promotional movie of WoW. This time he didn't underestimate how long it would take, and the spawners were his only available warm bodies because monster spawn placement turned out to be faster than anyone anticipated. For a full week, Shane was shouting into his speakerphone and directing his "actors" on what to do. He got so much footage he decided to edit it all into several movies with the idea of releasing them over a period of time. He was cutting the best footage into several three-minute movies, and he gave them to Victor

Crews, who had composed much of Blizzard's music, so he could create some background accompaniment. Joeyray Hall, from the cinematics department, helped polish and edit the low-tech, low-res footage as well as one could before the days of efficient video compression (below).



Spawnmap of Duskwood zone by Bo Bell, 2003. After exterior level designer Bo finished a zone, the artists needed to give their approval before it was handed over to the design team. Approved zones were ready for monsters, so a spawn overview meeting determined its population. Appropriateness, variety, and avoiding overuse were the three primary factors in a zone's creature roster. After a couple of weeks of placing and testing monster spawn points, Duskwood was ready to have quests and NPCs added. If all went well, the zone would be included in the next alpha test. Image provided courtesy of Blizzard Entertainment, Inc.

Gameplay trailer by Shane Dabiri, February 2003. Shane barked into the speaker phone, “Okay, nobody move… Matt, where is your gun? Get out your gun and get ready to shoot when I say so. That helmet looks retarded, Bo. Get a cool helmet on. I don’t want anyone casting spells, including buffs. Okay, Andy, when I say so, point—no, don’t equip your sword, just point…and when I tell everyone to shoot keep firing until I say stop…” Making trailers was exhausting work and our best-looking footage required coordination that was totally irrelevant to gameplay. Image provided courtesy of Blizzard Entertainment, Inc.

February 2003:
The Rightful Fear of Artificial Intelligence

February became another late-night month as Team 2 crunched to ready the game for the third alpha for in-company testing, and content was pouring into the world faster than ever before. Night elf buildings were finally going into the game, and the Scourge had been redesigned again, although Chris Metzen still needed to repeat himself that he wanted the undead to be called *the Forsaken*. He explained, again, that they were not exactly undead or evil, but rather plagued humans battling for survival. Chris emphasized that the term "Scourge" applied only to abominations, ghouls, and undead monsters rampaging through the countryside. While Chris's storyline of misunderstood outcasts was compelling, Allen Adham (and others) tried to convince Chris that it might be more fun to play an evil, violent monster.

Amid this confusion and debate, 3D level designer Dana Jan patiently waited for the go-ahead to begin working on the starting zone buildings for the undead. The verdict was that the Forsaken *wouldn't* have crazy and magical *Warcraft III* structures like ziggurats. Instead, they became burned-out human dwellings. This helped a lot with production, because we could borrow from Aaron's human buildings. Development was like that sometimes—various art assets were vastly easier to create than others and the easiest route often became the final decision. For instance, the tauren buildings were tents and log cabins that shared common textures such as wood and canvas. These 3D models and textures were easy enough to create, so the capital city Thunder Bluff took only a few weeks to build, whereas the ruins of Lordaeron and the Undercity took both Jose Aello and Dana Jan many months of work. Regardless, the Forsaken's starter zone buildings were the last exterior buildings to be built, which meant dungeons would soon become a priority.

Because of our long working hours, lots of features had been added to the new build. The user interface conversion to Lua/XML was complete. Sam Lantinga's XML code allowed users to completely manipulate the UI and implement their own interface functionality, although this wasn't a feature anyone could fully appreciate until it fell into our fans' eager little paws. Meanwhile our new "push" functionality updated clients with content automatically, and the game featured an in-game bug/suggestion UI that proved invaluable for alpha test feedback. Tim Truesdale's code for manipulating water flow was finished and working in-game.

Our advanced AI was also implemented. In a test, Sam Lantinga pitted a party of thirtieth-level players against twentieth-level bots in the arena, and the devs had a very hard time beating them, despite being ten levels higher. The world design team (spawners) were the usual guinea pigs for these experiments. Geoff Goodman jumped back when his character neared the

bots, who were waiting on the other end of the test area in the Stranglethorn arena. When Geoff approached, all the bots buffed themselves and turned to face him but made no motion to attack. Watching the AI bots react to his distant approach was both eerie and intimidating. The bots did this based on proximity to enemies and the programmers explained it was very easy to script bots to be perfect fighters because they never hesitated and fought with maximal efficiency.

Mulgore zone boundary by Mark Downey, March 2003. Almost all of Azeroth was finished by this point, and the exterior level designers were making the first pass in the Kalimdor zones. Mark had already placed the tauren city, Thunder Bluff, into the game, leaving only the night elf and undead cities to do. Roughly half of the landscape had been completed by this point. Image provided courtesy of Blizzard Entertainment, Inc.

March 2003: Internal Alpha 3.0

By the end of the February 2003, the latest company alpha test was live and the good news was the player classes felt balanced—or at least nothing felt too broken. Team 1's lead designer, Rob Pardo, had designed how each class played. He believed it was especially important that they all felt different, fulfilling distinct roles using unique game mechanics, such as the warrior's rage bar or the rogue's finishing moves. The data showed there weren't any unpopular classes, so the designers moved past the twentieth-level abilities and class roles become more distinct. The Forsaken were playable, but all races were still limited to starting in either Anvilmar or Goldshire. The first pass of trade skills received positive feedback, and there were surprisingly few major changes to Eric Dodd's crafting system. People only wanted more.

Thanks to newly granted permission that allowed the devs to play from home, our server code continued to get stronger as player loads hit a new record with over two hundred simultaneous users. Validation CDs were given only to immediate family members. After keeping so many secrets for so long, the potential for leaks was still strong, but the game needed to be tested by more people. The reception from significant others was so positive that even spouses who weren't typical gamers were finding WoW quite addictive, and their phone calls were less, "When will you be home tonight?" and more "How can I raise my tailoring skill?" This was an encouraging validation of the game's appeal to non-core gamers.

In light of these rave reviews, Mark Kern studied the multimillion-dollar order for North America's server hardware and wondered if the estimates were too low. Would American casual players really pay for subscriptions? Our Asian prospects were a wild card; anything could happen. But we couldn't afford a miscalculation in North America. Our game was looking good, but the MMO market seemed downright toxic.

Tempering our expectations were the sales figures of EA's *Sims Online*, which by our estimates was supposed to have been a sure thing. Despite the runaway sales of its single-player titles, *The Sims* subscription-based multiplayer online game was poorly received. We had hoped its sales would broaden the marketplace. *Star Wars Galaxies* also got a lukewarm response from its beta testers. This had us worried about our own "sure thing." Leaked SWG screenshots were very different from the promising visuals previewed in magazines, and with their April launch date, it looked as if they would release the game before it was done, so one of our concerns was that this might turn off potential customers to MMOs in general.

In the wake of these negative reviews for MMOs, we released our own gameplay trailer for *World of Warcraft* and the team was charged up about

our fans' response. There still was speculation about system requirements (we'd forgotten to point out the very modest system specifications of the machine used to record the video), and many believed it would be years before we finished the game. Still, the feedback was almost universally positive. The smartest thing about the "new" footage was that very little was being revealed about the game. There weren't any new features or races. A brief shot showed an underwater shipwreck, and fans freaked out about the concept of swimming—something we'd gotten used to; we'd forgotten that underwater navigation was new to MMOs.

We also gave Blizzard's PR people a schedule for releasing feature information. WoW would be featured in a magazine every month until the September beta, with exclusives about new races, zones, cities, dungeons, features, and gameplay details. Everything was scheduled with the various magazines and websites to raise awareness of our game, and we were hoping to finally make a big splash at E3 in May. It was likely we would just use the current alpha 3.1 as the demo build, so the E3 preparation and polish wouldn't cost us too much time.

Amid international tensions with North Korea and a SARS outbreak, Mark Kern traveled to Seoul, Taipei, Taiwan, Hong Kong, and mainland China for ten days to establish upcoming partnerships with distributors that would maintain our Asian servers. While Mark prepared for his Asia tour, Shane Dabiri returned from 2003's GDC. While its seminars weren't usually pertinent to Blizzard's projects, the theme of the conference seemed to be Korea and MMOs; it appeared other developers were also taking the Asian markets seriously. Meanwhile, Bill Roper, the company's chief spokesperson, had been on an Asia press tour visiting China, Korea, and Japan, and he had sent Team 2 an email:

> Just wanted to pop off a fast email about how well World of Warcraft was received on the press tour. People were really taken by even the little bit we showed them, and when we make the massive amount of announcements planned between now and the beta, we will have the kids salivating even more. If we do things right (fully localized, simultaneous launch, etc.), Asia will be MASSIVE for us. At every stop they really talked up how Online Gaming (their terms for MMORPGs and basically anything that is online only) is the next major thing in Asia and that the projected growth over the next three–four years is staggering. This is quite obviously the direction that the Asian market is taking, and they are hungry for awesome content.

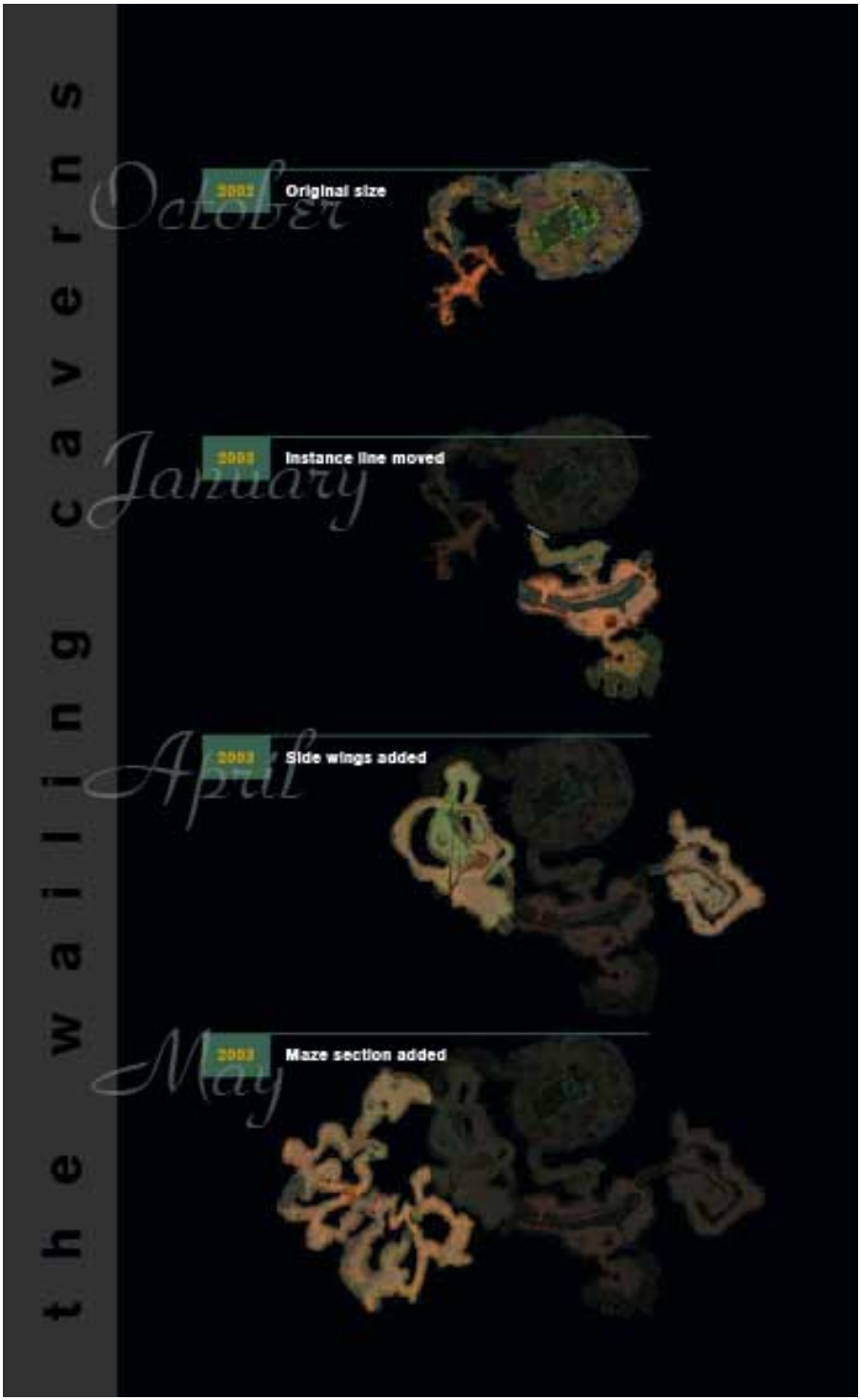
We had another team meeting in early March, our first since January, and we

discussed expectations. Allen Adham really thought a million subscribers was possible, which would make WoW the first billion-dollar game over its expected five-year lifespan. A large number of devs thought the game had longer legs than that; I personally predicted a twenty-year run. The meeting also marked the beginning of the last development year. We were fully expecting to shoot for March 2004, and after E3 in May, the team would be in full burn mode until the game shipped. “Burn mode” meant working until 10:00 p.m. or midnight at least four days a week for the expected ten-month crunch; a common pace for meeting deadlines in the games industry.

An encouraging note from the alpha was that people were playing PvP for fun and were champing at the bit for organized teams. From the technical support team in the QA department downstairs, a challenge was issued to the development team’s world designers to meet them in the Stranglethorn Coliseum at lunchtime. So ten level-twenty players squared off in the PvP zone and battled for bragging rights. The developers (our spawners) withstood the tech support charge (led by a tauren, who took the brunt of the counterattack and died in the first five seconds) and laid down a frost nova that damaged the entire tech support team. The spawners lost only one player before killing the last of the challengers.

The first organized PvP challenge, March 14, 2003. When tech support challenged the devs, their call was answered. The tech support players were Thor Biafore, Jason Stillwell, John Schwartz, Trevor Rothman, and Nathan Lutsock. Team 2 players were Steven Pierce, Michael Backus, Andy Kirton, Shane Dabiri, and Geoff Goodman. Other employees organized team

battles in tournament ladders because more people want to play. Image provided courtesy of Blizzard Entertainment, Inc.



Images provided courtesy of Blizzard Entertainment, Inc.

"There's no such thing as a dungeon that's too big. When in doubt, make it bigger."

— Jeff Kaplan, ever fearful we weren't making enough content

The Growing Pains of the Wailing Caverns

When Chris first described the Wailing Caverns as "a cave with dinosaurs running around," that was all the lore I really needed to hear, because I loved caves and couldn't wait to build one, so I borrowed memories of cave tours I'd taken on family vacations. My personal goal was to create the first convincing cave for a computer game. The actual process of creating every single stalactite and stalagmite was tedious, but everyone seemed pleased once Stu Rose finished painting textures for it. Allen Adham loved how the Wailing Caverns looked, but surprised me when he put the instance at the end of the "final" big room instead of the front entrance. I couldn't believe it. After months of work, the instanced section hadn't even been started! "Why wouldn't we just put the instance line out front, when players entered the dungeon?" I asked Allen incredulously.

"I want people to get the flavor of it before they commit to crossing the instance line," Allen explained. "People searching for groups can just go there, kill things in the big 'common room' outside the instance line, and when they fill up with five players, they'll all go in." His supposition described the *Everquest* paradigm that seemed to work just fine.

At the time, we didn't know how long it would take to kill monsters. We didn't know how many people would be on each server, so we didn't know how much content was necessary to keep the looking-for-group (LFG) players busy. We didn't even know how long it would take to clear a dungeon, or if people cared about clearing it to reach the final boss. Without these answers, we just built things to see what felt right. Each dungeon went through its own process, and some were easier than others (some were even scrapped). Dana Jan's Uldaman wasn't linear (game designers couldn't say whether or not linear layouts were good), so its quests required multiple visits. Only until Uldaman was built, quested, scripted, and played by non-developers did we learn players didn't like leaving a dungeon unfinished—they wanted the closure of a full clear.

In hindsight, it seems obvious that our early dungeons were too big, but previous MMO dungeons were epic experiences embraced by only the most hardcore players. The paradigm of big dungeons was established by *EverQuest*'s non-instanced play spaces, where play spaces needed to

accommodate everyone on the server who wanted to go there. Besides, we didn't want people to play though content too fast; otherwise, they'd be done with WoW in only a couple of months. What we didn't realize was how much "private" play spaces (instances) would shrink the amount of overall play space needed. Besides, the concept of a short, one-hour dungeon didn't exist in MMOs. The closest thing to a one-hour dungeon were the wings of Aaron Keller's Scarlet Monastery. We learned only after shipping WoW that players really liked short dungeon runs, and so the Scarlet Monastery's "wing approach" was the direction taken by subsequent expansions.

During the second concept meeting about how to expand the Wailing Caverns, Chris said, "Just make a boss room like the Crone Room in *The 13th Warrior*." I told him I liked that idea and built it beyond a cavern with a flooded ravine.

After seeing the second iteration, the game designers said it needed to be a lot bigger, and I was all too happy to accommodate them. This was long before pathing code was finished, so no one could actually test what it was like to fight monsters. I added to the layout two gigantic wings.

But I still worried that it wasn't "a lot bigger" and put in the fourth addition: a maze section. I wanted to see if there was something interesting we could discover about mazes that would enhance the gameplay experience (spoiler alert: there wasn't). After we learned mazes weren't fun, I revisited the dungeon and took great pains to overload the maze with props and doodads. I even put a mushroom trail throughout it so people could take the shortest route through without getting lost, but as it turned out, the mushrooms blended in with the rest of the clutter.

April 2003:
A Slightly Higher Profile

Having returned from Asia after being quarantined for SARS for three days, Mark Kern bore the brunt of many "patient zero" jokes at the office. Amid the teasing, he confirmed the suspicion that WoW could become very popular in Asia. Service providers already considered WoW a must-have product and were bending over backward to host it. Mark toured the customer service storefronts (where bulletproof windows separated the complaints department from the customers) and visited the Internet cafés. This allowed him to see firsthand the amount of server hardware needed to host China's millions. Even though WoW's server architecture was much more expensive and complex than any other Asian game, businesses there were eager to adapt. Mark also learned how large a live team would be needed to service a million-plus subscribers. In short, our game distributer, whoever they turned out to be, needed to be *very* geared up with both hardware and customer support.

Meanwhile, domestic coordination made progress. The team passed around an advance copy of an E3 magazine with WoW featured on the cover. An article in it included a rundown of the most anticipated games, and someone had listed WoW in front of *Star Wars Galaxies* for the first time ever. We were also looking forward to our E3 announcement of flying taxis because they distinguished us from other MMOs.

The E3 gameplay movie remained the last thing to fine-tune, and the cinematics department helped us edit and add fake sounds to the action. There weren't enough audible assets in our game, because sounds were easy to implement and therefore delayed until the very end of the project. This was just as well, because E3 was too loud to hear the game anyway.

While the team added more zones, spells, and trade skills, the dungeons still weren't working yet, even though we only had a year left on our schedule (or so we thought). At least more dungeons were getting textured (the Wailing Caverns, Shadowfang, Scarlet Monastery, Deadmines, and some micro-dungeons), but we still had only a weak idea of how big to make them. Until pathing code was finished, monsters wouldn't walk around correctly, so dungeon experiences were still untestable. Getting pathing code to work was the only big push left for the forthcoming E3 build, and Scott Hartin, our engine guru, was still banging on it. Scott had several viable solutions to pathing code (he'd already tried almost a dozen different approaches so far), and none of them were as clean or efficient as he wanted. Scott was one of the team members who often worked on weekends, so no one needed to pressure him; he was his own best motivator and harshest critic. But since the rest of his engine ran well, no one doubted his ability to deliver.

Even if Scott's pathing code had been final, our characters hadn't reached

a high enough level to test most dungeons anyway. The game designers were busy creating twentieth-level character abilities, so there was no way to test a thirtieth-level dungeon, which proved that the delays to testing dungeons weren't only due to engineering.

E3 mural by Bill Petras, April 2003. The giant image behind Blizzard's presentation stations promoted our favorite feature and suggested an epic game. Originally the scene was going to depict a battle between adventurers and ghouls in Deadwind Pass, but Bill Petras was torn between art directing the game and various promotional pieces, so he began painting with only two days before deadline. As a result, he went with a simpler scene. While the ghoul battle was a cool idea, the demo stations and crowds would have obstructed the cool details, so he composed a single, strong image that wouldn't take long to paint. Image provided courtesy of Blizzard Entertainment, Inc.

May 2003:
The Sweat behind the Easy Sell

By the end of April, fewer and fewer people were playing the alpha. The dedicated players had all hit their level caps and were unable to continue. Team 1 was busy crunching for the *Warcraft III* expansion, *The Frozen Throne,* and everyone else in the company was helping them test it. Blizzard North had been outright banned from playing WoW during work hours (again) because too many people weren't getting work done. And Team 2 was crunching for E3 (again) and were genuinely sick of playing the same human newbie zones over and over. There were some comments that the game was less fun once a player reached twentieth level—that leveling became slower, and it wasn't easy to solo. People worried that classes weren't distinct and lacked unique abilities. The game designers explained that leveling would have to get slower at some point and reassured us that class roles would gain definition at higher levels.

The build for E3 wasn't going as smoothly as we hoped. Things were breaking—for instance, doodads were still aligned on the wrong axis (causing them to rotate in-game), and this bug in particular was driving Collin Murray insane. As soon as he submitted a fix that oriented the props in the right direction, other props would mysteriously tilt 90 degrees on their side. He'd been working on this bug for months now (including weekends; Collin was another weekender) and had lost his usual good sense of humor. As further evidence that the game still wasn't done, on the content side, textures and doodads were disappearing (causing Shane-cubes to pop up). Of course, the game was nowhere near done, but visitors at E3 always judged in-progress games as if they were finished—and we wanted to meet even unreasonable expectations. After a couple of weeks of very late nights, the programmers nailed down all the showstoppers and the art team had updated all the placeholder/missing art. We would show off our true interface, trade skills, and quest system, and since we had nice big cities, we figured it wasn't the end of the world if we didn't show dungeons. The producers scheduled when we were supposed to work the E3 booths and what information we could divulge.

The upper floor of the Blizzard booth was the site of our best demo stations, where noise levels died down to an ear-splitting roar (some areas on the floor surpassed a hundred decibels). Photo by IGN

E3 turned out to be a much easier sell than the year before because the game was closer to being finished. Since we were preparing for a public beta (even though it was still half a year away), we were able to show WoW's features and talk about our game in more solid terms.

At 10:00 a.m., the doors would open to let in tens of thousands of people to the show. I had my standard-issue Blizzard badge, but my friend Steve Glicker gave me an extra press "backstage" pass. Steve ran a website called gamingsteve.com, and I tagged along to watch press events behind closed doors, giving him a developer's perspective of whatever we saw. Steve and I had been going to E3s since the mid-nineties using his press credentials, which also gave us early access to the show. On my way to the VIP entrance, I passed some of my coworkers (who were waiting in line for their doors to open), and they jealously shook their fists and bared their teeth as I weaseled my way onto the floor early. I pantomimed a sarcastic shrug to express how terrible I felt that I was getting special treatment.

Steve and I first hit a few booths we wanted to see before the masses entered the event. He knew I'd be at the Blizzard booth all day, so we crossed a few of the must-see games off our list. After a couple of hours, we headed

toward the Blizzard area to see what was happening. One of the first things I heard was expletives coming from an *EverQuest* designer (I could tell by his badge); he was reacting to our flying taxi rides. "Our fucking programmers told me flying taxis were impossible! We could have done this sooner!" He was genuinely angry, and I had to turn my head to hide my laugh. In truth, flying taxis created severe frame rate problems for us, too, but we strategically restricted flight paths to areas where the frame rate drop wouldn't be noticeable.

In the years of tagging along with Steve, I'd learned how most companies ran their E3 booths. They had secret doors in the structures leading to quieter areas where people could talk without shouting into each other's ears. These small conference/storage rooms were filled with boxes of T-shirts, press packets, coat racks, packing equipment, trash cans (that were always full), and donut boxes (that were always empty). PR executives at various companies had invited Steve and I into these secret areas from time to time, and I had learned that the crucial resource, water, was often stored inside. Pallets of bottled water were stacked in the Vivendi Games secret area, and since I also had a Blizzard badge, I could go in whenever I wanted, although most of the suits seemed surprised to see me there (I just looked bored so people assumed I belonged there). Throughout the day, I was able to duck in and grab armfuls of bottled water and pass them out to my teammates (the same ones I mocked while sneaking into the show early). Their eyes lit up, and they expressed undisguised gratitude in hoarse shouts of "Where did you get the water?! You're a lifesaver!" I'm proud to say I kept most of the team hydrated for the duration of the event, and it felt great to be the bearer of essential provisions.

Scott Hartin waved me over to talk to a bunch of engineers he knew on the *EverQuest II* team. He introduced everyone and asked me to show them the game. He explained his voice was shot from shouting over the noise. "I can't talk anymore. Show these guys everything, answer all their questions." I had to look at him to see if he was being serious. It was strange talking about the nuts and bolts of the game with unfamiliar people, let alone competing developers. As the guy who built the engine, I could tell Scott was brimming with pride as he watched me explain how our game worked to a half-dozen programmers. Brian Hook, another id Software alumnus, once told John Cash he really respected the WoW engine. He knew it wasn't the engine that magazines wrote about because it wasn't filled with the latest whiz-bang graphic features—yet it did amazing things on low-end systems, and Brian Hook was savvy enough to appreciate it. So I gave Scott's programmer friends a breakdown of what our game offered, sticking to technical numbers, such as our polygon budget on various screen elements. I explained where the polygons went and talked about our tools, and the production pipeline. They asked questions and I answered as best I could. Scott would jump in when needed and answered technical queries like how we kept "batch counts" down. I showed them how we faked our horizon line, how many textures a

scene used, and how many frames per second each feature cost. They didn't hide their appreciation and thanked us both for the in-depth presentation. The *EverQuest* developers even gave us a tour of their booth (which was off-limits to the public) since they were just as eager to show off their work, but the Sony executives quickly spotted this and chased us away.

For three days we shouted over the cacophony of the floor and explained to anyone who would listen what to expect from WoW. I talked to enthusiastic webmasters, fans, and developers, all of whom recognized WoW's potential. Some fans excitedly jumped up and down as I showed them features. That was the kind of feedback that made all my working weekends worthwhile. The only people who didn't express enthusiasm were distributors and executives. They may have known on an intellectual level that WoW was going to be a hit, but they didn't seem to care about the features that impressed players. Since they weren't gamers, I tried to win them over by explaining how many languages we were translating the game into (six) and how partners around the world were lining up to support our game (that really caught their attention). I even shared my personal suspicion that the game could last for twenty years and that we had tons of ideas we hadn't yet implemented. People searched my face for signs that I was kidding them—but I wasn't. MMOs were everything to everyone, and I imagined we were capable of supporting a countless variety of mini-games. I even did a demonstration for Richard Garfield, the designer behind *Magic: The Gathering*. I explained to him how our trade skills worked, guessing he'd appreciate how our rewards were integrated into equipment and crafting. It was hard to tell if he liked what I told him; he was very cordial but his countenance was unreadable.

We let people play the game and happily answered questions. By letting people actually play WoW, we gained a credibility we previously didn't have or deserve. There was no more skepticism; we had a great frame rate and a (mostly) stable build. There was a memory leak that made it necessary to reboot the system after a few hours, but that barely mattered. The one question everyone was asking because the zones we showed looked polished: "When are you shipping?" We told them the usual "When it's ready," because we honestly didn't know ourselves. Many gave me reproachful looks as if I were being coy, as if the game were ready to ship now. Only when I mentioned that we needed more zones and dungeons could I convince them we still had a long way to go. We told them we were planning to have public testing later in the year, and that mollified even the most persistent interrogators.

The 2003 E3 was our last all-positive feedback. If the highlight of WoW's development was announcing the game, then talking about it at the 2003 E3 was the next most satisfying moment. After the public beta, the fans advanced to the Complaining Phase, where, I imagined, they would likely remain until the game lost its popularity.

Programmer Isle, March 2003. This area was a testing ground for experiments such as lava flow effects. A travel advisory was always in effect on Programmer Isle, because remnants of broken code often caused client crashes. Most of the programmers knew where the troubled areas were and just avoided them. Image provided courtesy of Blizzard Entertainment, Inc.

Programmer Isle

In the *World of Warcraft*, no place had fewer visitors than Programmer Isle. It was a location unknown to people outside the Team 2 programming staff, and we preferred to keep it that way, since things there tended to be very crashy as a result of all the mad experiments.

But if someone could get to the coordinates 16,000, 16,000, they'd find themselves in a bizarre land—even by Warcraft standards. This desolate location saw collision tests and frame rate recordings of every kind. Many quests, features, bugs, and placeholder assets were tested and abandoned here. Before anything was deemed "safe" for the rest of the world, programmers tried it here in the world's "margin." There were crash-zones and gigantic empty spaces without trees or props. Places like "Dead Man's Hole" and "FUBAR" were points of interest. Some of the landscapes were scrawled with gigantic notes (written in ground textures) with "work-related" messages such as "Chow is my love monkey"—a poke at one of our programmers, Jeff Chow.

Dead Man's Hole on Programmer Isle. It could have been a long-defunct volcano crater or the result of a meteorite impact from time immemorial. No one remembers who made Dead Man's Hole, or why there was a house in the middle of it. Image provided courtesy of Blizzard Entertainment, Inc.

June 2003:
A Crunchier Crunch

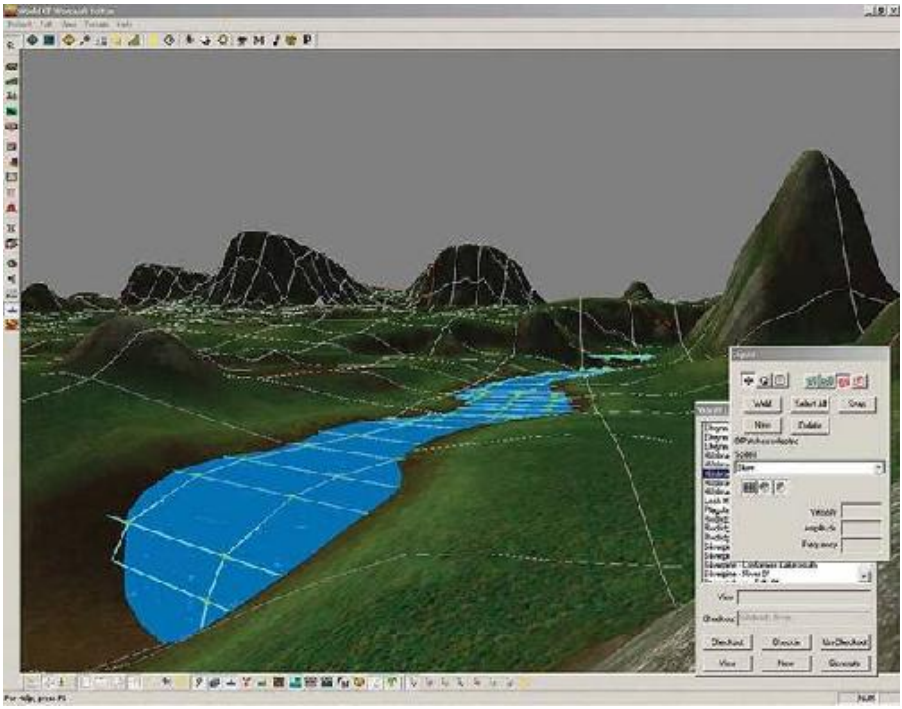
The dev team continued the crunch we'd started before E3. We were still working late four nights a week toward what many of us considered naive deadlines for the friends-and-family (F&F) alpha that was only a couple of months away. Fifty-three people working twelve-hour days could get a lot done, but shipping by February 2004 was only a best-case scenario. In June, we were more concerned with getting a stable alpha ready for the F&F test. Mark Kern sent an assessment to the team:

> Here is the first of regular weekly code updates for the team:
>
> Some of the things we've done/been working on:
>
> · Immense work on the pathing system (thanks, Scott). New system should be ready to go soon, but will continue to be refined over time. Pathing will include new straight-line pathing for exteriors, much-improved interior pathing, interior to exterior transitions.
>
> · A daily Korean build with Korean UI and a fully localized Anvilmar zone for testing.
>
> · Localization tools for different languages.
>
> · Many skill/spell/trainer tweaks.
>
> · Logging of events on the server (for GM tools and designer alerts).
>
> · Faster load times (up to 10x) to make your gryphon flying even more enjoyable.
>
> · New spell graphic effects (procedural chain lighting).
>
> · NPC and Item Editor (months in the making, this will make creating NPCs and items a snap, and let you view them as they would be in the game).
>
> · Working on the doodad problem in WMOs.
>
> · New UI features and polish.
>
> · New network layer.
>
> · New hardware for Alpha and Beta Hardware ordered.
>
> Things we are going to do:
>
> · More pathing work, including pathing on top of doodads and underwater.
>
> · New Patcher that includes patch notes, log-in, and EULAs.
>
> · New, slimmer, less filling patch sizes.

- Spell effect previewer in wowedit (will have basic features).
- New Talent system.
- Accounts with CD-Key support (for beta).

In keeping with Mark's push for localization, Derek Sakamoto and Jeremy Wood expanded our UI to accommodate Asian characters, and a couple of translators localized the Korean version of the game (working at desks in the hallway) so we could do a simultaneous beta in Korea (something no one had ever done before). Wowedit exported and read text files to make localization easier, so the translators would have most of the game converted by the time we were done. After a few weeks of initial work (localization was an ongoing process), the dev team and the localization staff returned to Korea, where they would soon begin hiring Korean GM staff.

Despite the progress with localization, there were legitimate concerns that we might not make our self-imposed February deadline for releasing the game in 2004. Before our launch, we still had to manage a friends-and-family alpha and a public beta that would gradually ramp up players as the game was finished. Many wondered if this nine-month plan was unrealistic (spoiler alert: it was), but the company was pouring so much money into the project we needed to be in revenue. Vivendi Universal, our parent company, was strapped for cash after its dotcom bubble burst. Vivendi posted an eleven-figure loss and suffered an 80 percent drop in share value. Its CEO went from being harried by Parisian paparazzi to resigning over scandals, and eventually went to prison. Given this situation, money wouldn't be coming *from* our parent company—it would go *to* it. Blizzard's prospects of borrowing enough money for our servers and extending our dev cycle indefinitely wasn't in our horoscope. This was one reason we needed to launch the game. Much credit went to the upper management team of Mike Morhaime, Frank Pearce, Allen Adham, and Paul Sams (whom we referred to as the Four Horsemen) for maintaining Vivendi's support while shielding the team from the company's budgetary pressures.



Rivers, engineered by Tim Truesdale. Tim created a water system and added wowedit functionality to give designers control over it. Above, a patch editor controlled both the water height and the direction of flow. Image provided courtesy of Blizzard Entertainment, Inc.

In addition to the few hundred employees and their immediate families, the next alpha would include a few personal friends of each employee, potentially adding five hundred users to the server's population. We had so much work left to do that speculation on finishing wasn't even discussed. No one planned vacations.

The designers were rethinking combat in regard to monster groups. Kevin Jordan explained that there was too much down time and it felt too close to EQ, where a single monster of similar level would reduce most characters below half their health. The last thing we wanted players doing was meditating between every fight, which was an EQ game mechanic where players regained their health and mana by sitting and doing nothing for whole minutes. "We're going to reduce damage output so we can give mobs pets and pair them up. That way, if they pull an extra set of monsters it doesn't mean the player dies." A small reduction in monster damage would change the pace of combat, the player grouping dynamics, the patience required to level efficiently, and the overall appeal of soloing. Easier monsters meant combat could mirror *Diablo* more, where a single character battled multiple enemies. We expected this would make soloing combat much more interesting, as our monsters would be able to heal, buff, and tank for one another. The argument

against this was that it would dramatically increase the number of monsters in the world and it might affect frame rate.

In addition to the combat overhaul, the designers expanded the bonus for leveling (talents), meaning a newly leveled character no longer allocated an additional attribute point to their stats. The new method allowed characters to learn general abilities and enhance their combat performance, making them more distinct. It was thought that enhancements such as increased damage against monster-types would be more rewarding than raising strength by a point. There were so many more unique class abilities that the next alpha would almost play like a different game.

We had finally decided on a cinematic movie for *World of Warcraft* to establish the game and inform the players something about the different races and classes. It was only nine months until our shipping date, so we were cutting it close, and very little had even been storyboarded. Chris Metzen wanted to focus on the cosmogony of the Warcraft universe with a Genesis-like cinematic depicting how the Titans created the world. He was met with almost universal resistance from the dev team, who wanted to focus on the world and characters they'd been working on rather than Metzen's story-driven approach. We were also considering options for our box cover art, and one of the new approaches we were taking was hiring Korean artists to design our Asian packaging…but so far nothing had been decided.

After a year of on-again, off-again work, Scott Hartin achieved efficient and stable performance with interior pathing. This code allowed monsters to chase players and navigate obstacles when inside interior spaces. After this code was implemented, game designers could spawn monsters in dungeons and script battles. This meant the team would finally be able to test grouped combat in interiors, which might redefine how dungeons should be built.

And there was even more love for the dungeons. Thanks to Tim Truesdale, mini-maps were finally working for interior spaces. A top priority since the project's beginning was preventing players from getting lost in a dungeon, and Bill Petras was our guinea pig for orientation tests. He was renowned for his poor navigation and represented our worst-case user, the lowest common denominator. Without any combat to distract him, he immediately declared he had no problem finding his way through one of the most disorienting dungeons—Jose Aello's symmetric Sunken Temple—so the mini-map system got the green light, which meant players would stop blaming interior level designer Aaron Keller for getting lost in our cities.

The most anticipated agenda item in the monthly team meetings was the design update. Allen Adham held everyone's attention using his patented Jedi mind trick as he detailed major changes and minor additions to WoW. Allen was soft-spoken and the room had to quiet down in order to hear him, and anything he said sounded like a terrific idea. Most of his ideas were innovative and his delivery was so convincing the team rarely pushed back—which was very atypical for this development team. One of his less-than-successful ideas

was removing cooldown timers in combat so the only thing preventing players from spell-spamming was a new system of diminished returns for repetitive actions. He surmised that diminishing returns would give the player the option of recasting a weakened spell instead of a cooldown system that restricted recasts, and that this would allow for more options during combat. Also, short casting times for spells were being reduced to zero. Immediate results felt better on a visceral level because players were no longer waiting for cooldowns. But after a while it became apparent players needed visual clues and hard stops to prevent them from losing all their mana. People didn't enjoy guessing how to be efficient, so Allen's new approach was eventually abandoned after weeks of the spawners testing his different combat models.

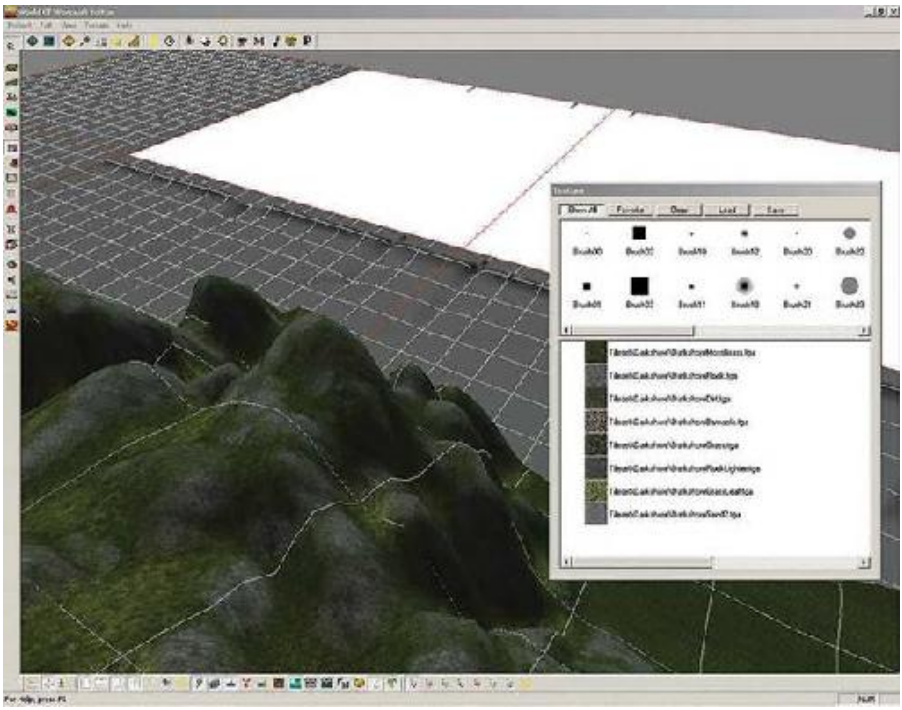
All of these tests were possible with the ability editor, which made intelligent encounters easy to create and balance without programming support. Issues of timing, efficiency, and strategy were now important, and play-testers adjusted roles and actions to accommodate the game's growing complexity. It was during these tests that Allen noticed something new. He quietly listened to the spawners, who were busy analyzing their tactics and performance after they were wiped out by a tough encounter. Allen grinned as he asked the room, "Do you guys realize what's going on right now?" Everyone looked at one another in curiosity as the room went quiet. "This is the first time ever when we have players talking about strategy. We just crossed a design milestone." The room returned his smile and savored the moment.

At the team meeting, the designers also discussed the new talent system, the engineer trade skill, and the final decision to go with instanced dungeons, which would allow for more robust single-player experiences that included puzzles, scripted actions, and events not normally seen in public MMO gameplay. It was Allen's Jedi mind trick delivery that put to rest the debates among the team on whether dungeons should be instanced. Everyone on both sides of the issue respected the fact that the instancing decision was a religious war, so opponents backed off to allow the game designers a chance to test their idea of private dungeons.

Another such religious issue was how to implement PvP. And since PvP went hand in hand with griefing behavior, it was often a question of where to draw the line. How much freedom would we give players? Many devs (and some designers) didn't want *any* PvP servers because it risked creating a poisonous environment in the game. Another nagging design issue was mounted combat. As soon as players were given control of a rideable mount, many of us romanticized how awesome it would be to fight while on a steed. Otherwise, mounts were just a speed-buff, and some of the devs wanted horses to be more like pets. Alas, no one could actually come up with a workable idea for the mounted combat mechanics, so enthusiasm for it eventually fizzled out.

By June 2003, Andy Kirton and Steve Pierce were the only spawners left

after others transitioned to different roles. Michael Backus joined Pat Nagle and Jeff Kaplan to be a quest designer. Josh Kurtz had moved from spawning to world design. Geoff Goodman was also a world designer, although he was especially strong in his understanding of game mechanics. Soon Jeff and Geoff would lead the charge in dungeon scripting and boss fights. When Geoff came to the team, he had been quickly promoted to the role of "monster czar"—a title that he thought sounded silly—meaning he created and balanced most of the basic creatures of the world. Geoff's role grew into that of the chief dungeon scripter for most of the complicated fights.



Darkshore exterior design by Matt Sanders. This was the basic view of how exterior level designers worked. A palette of textures and doodads seemed to always be open, and there were buttons for controlling water as well as environment settings for light, shadows, and fog.

Wowedit allowed exterior level designers to sculpt the terrain, but texturing was the most time-consuming part of zone development. Every surface was spray-painted with a mix of ground textures such as grass, gravel, or dirt (which were usually painted by Gary Platner). Once painted, doodads were placed. Image provided courtesy of Blizzard Entertainment, Inc.

The program that pulled everything together was wowedit (it was so ubiquitous we never capitalized it). Its suite of tools and functionality composed landmasses, hooked up creatures, and rolled game mechanics into one playable world. Scott Hartin had first created wowedit as a terrain editor and almost every other programmer had added their contribution to the composite tool. In addition to world-related settings for monster spawns, fog, and lighting, there were many dialog boxes dedicated to spells, NPCs, monsters, and item creation.

David Ray was the programmer in charge of writing controls for game logic so designers could edit the world without the support of a programmer. Joe Rumsey did the first version of the massive ability editor that allowed designers to create every game mechanic (spells) before passing the torch to David, since it usually fell on David's plate to create the controls within the editor. For instance, when designers needed a way to create taxi paths (for gryphons), David added an interface that gave them the ability to plot the points. He often worked closely with world designer Josh Kurtz to test out new functionality.

Scripting a Monster

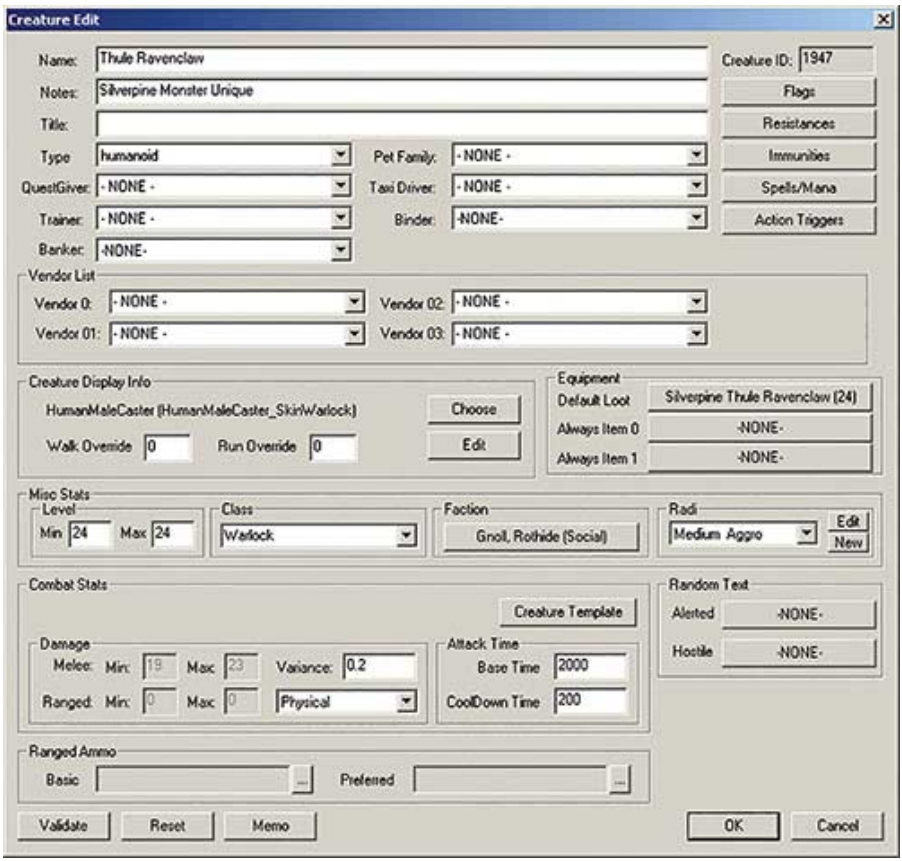
It takes a village to make a monster. After the artists sketched, built, and textured creatures, the animators gave them movement. Game designer Geoff Goodman combined these art components to give monsters spells and abilities. The base abilities were nearly all created by game designer Kevin Jordan (whom the Staff of Jordan was named after). Geoff often edited spells to such an extent that players couldn't recognize their original source, and he used Lua scripting for complicated fight mechanics such as Onyxia's flying behavior.

99 percent of the game's abilities were created by designers, and as far as the engine was concerned, spells and physical attacks were essentially the same thing. A sword swing was just a short-range spell that played the sword swing animation. Archery was a spell requiring a bow and arrow as spell components. Designers could set them to be different types of game effects and add window dressing such as visual effects (VFX), sounds, and animations. Only a couple of abilities (e.g., the warrior's charge) needed additional programmer code. Designer requests for programmer-written abilities were *heavily* scrutinized by the producers before receiving approval. Jeff Kaplan joked that nearly every boss fight in the Molten Core used knockback (an effect that mimicked physics by bouncing players in a

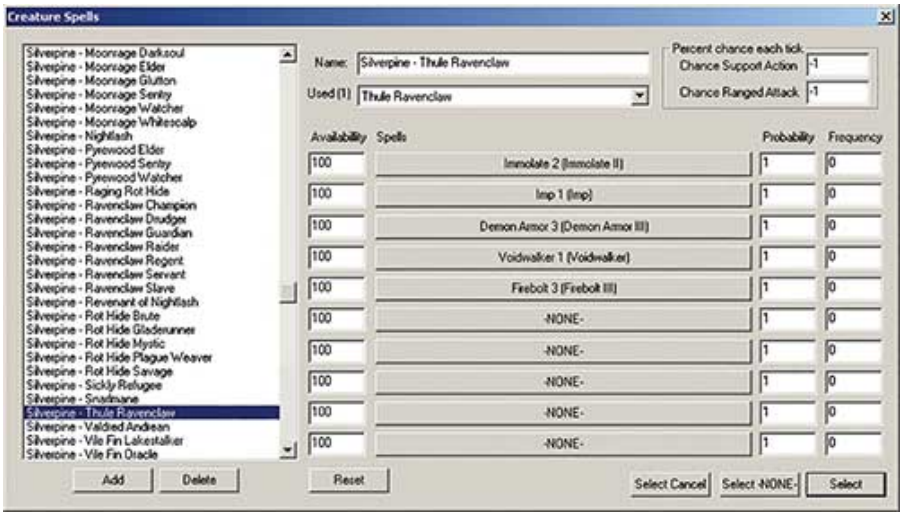
parabolic arc), yet he had to practically beg the producers to get it on the engineering schedule. Programing availability was *that* scarce.

Spells VFX were all done by lead animator Kevin Beardslee without a previewer. He couldn't see his textures, transparencies, or particle sizes until he exported their wire frames from 3D Studio Max, imported them into wowedit, hooked them up to an ability, and saw them in-game.

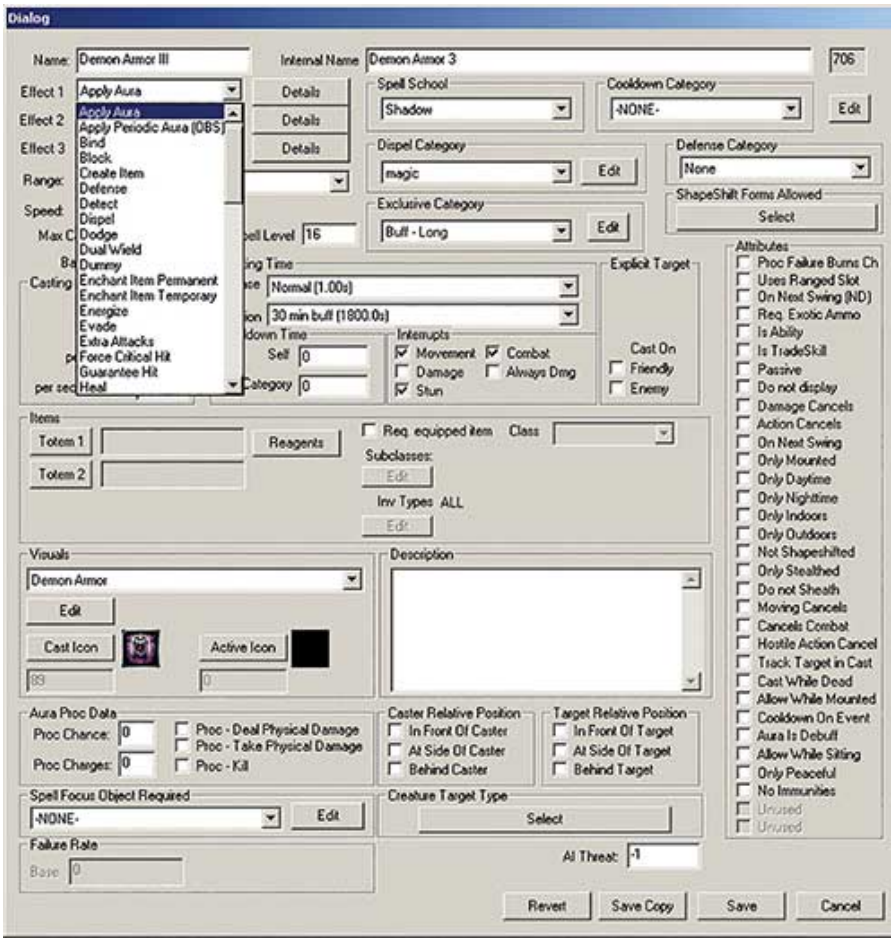
The game-logic pipeline for spells and art assets was held together by wowedit's vast array of dialog boxes, each filled with input fields and checkboxes. Any designer could create or edit abilities like fireball or sleep without programmer support, and this was what made monster and character creation extremely efficient in the long run. Wowedit's parameters also controlled aspects of item, quest, and NPC creation.



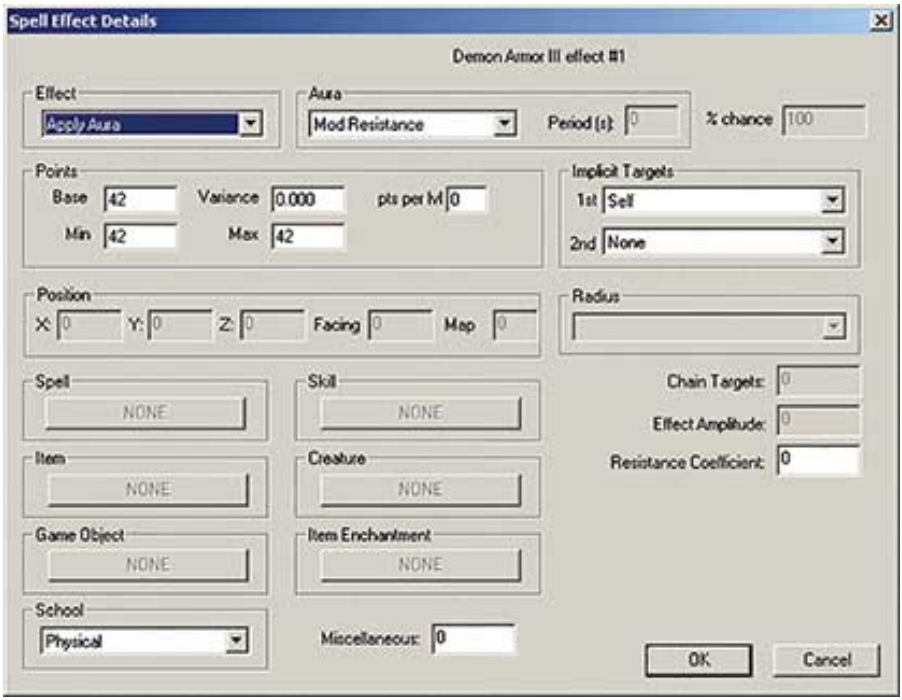
Editing creatures This is the creature editor dialog box for a boss monster in Silverpine forest. Buttons opened up more dialog boxes to further edit "Thule Ravenclaw" and his abilities. The **Spells/Mana** button in the upper right opened a new dialog box (see next page) that displayed Thule's spell set.



Editing spell lists Spell sets were created and modified for every creature in WoW. It was easier starting with a palette of spells because creating a new one took Kevin Jordan a full day (on average). By clicking on one of Thule's spell buttons, **Demon Armor III**, designers could edit the game logic, visual effects, and sounds (see next page).

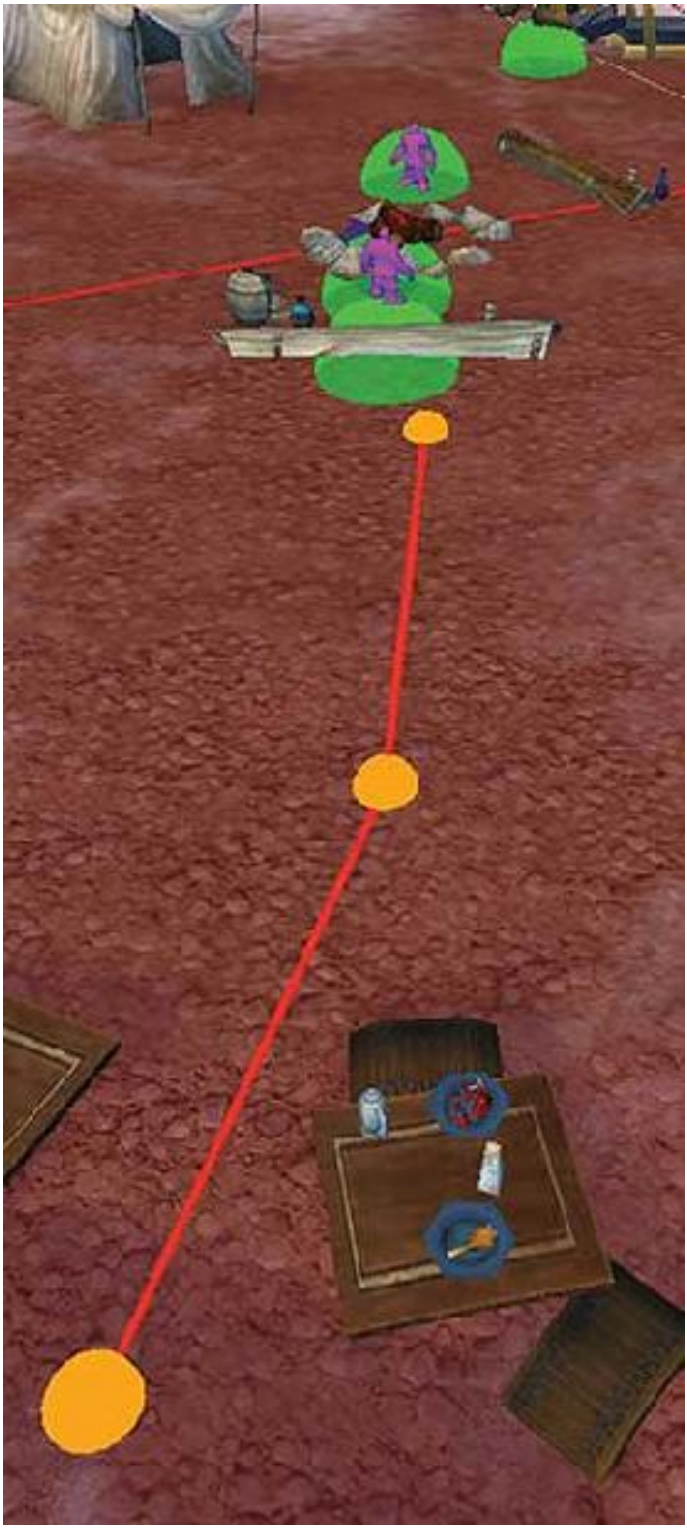


Editing spells and abilities Thule had Demon Armor III, and the dialog box below shows its spell properties. While Kevin Beardslee created the visuals of spells (such as the particle effects of sparkles and ribbons), designers could activate and modify them by clicking on the **Visuals** > **Edit** button (on the center-left) to access five additional dialog boxes that changed SFX parameters, such as when spell effects would play, as well as their size, position, and speed. The pull-down menu in the upper-left corner allowed designers to choose the behavior of a spell. Effect number one was **Apply Aura**, whose details are described on the next page.

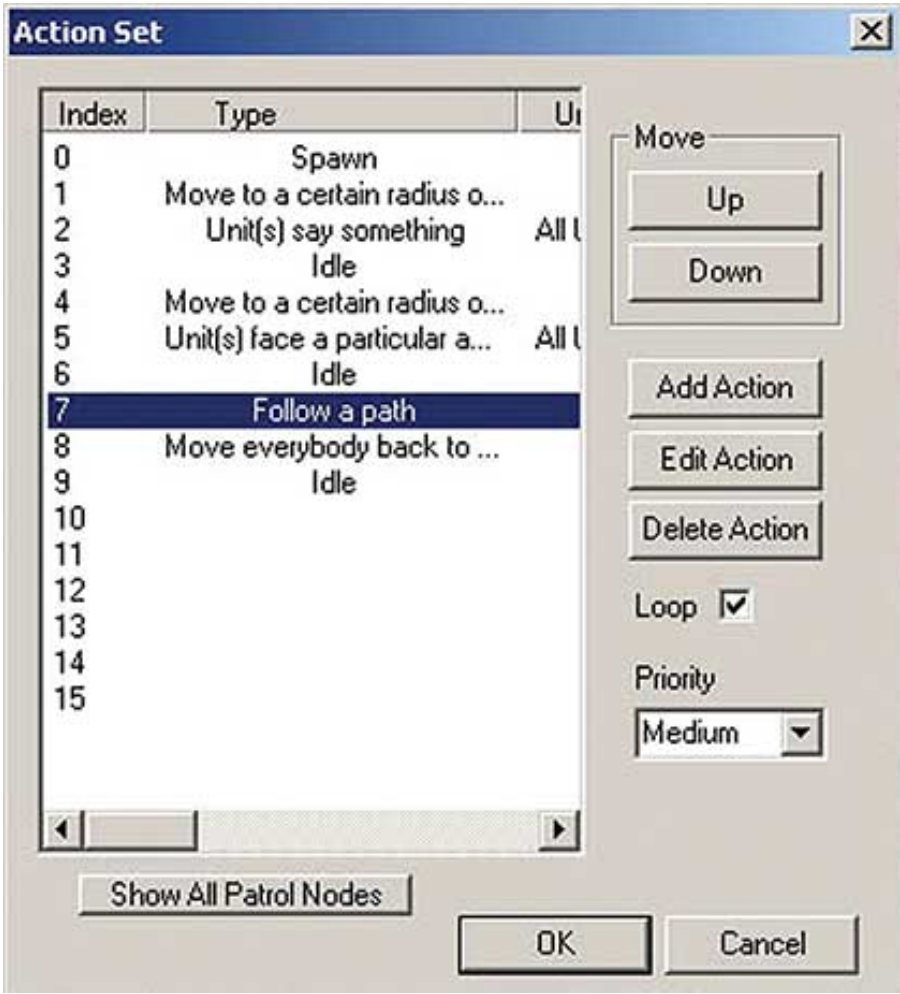


Editing spell effect details These are the effects of Demon Armor III. To support thousands of spells, wowedit had hundreds of unique dialog boxes with fields, pull-down menus, buttons, and checkboxes. As features were added, the requisite dialog boxes grew. There were over five hundred procedurally generated pop-up boxes that served as warnings, reminders, and progress bars.

Wowedit parsed ability effects and created tooltip descriptions (in yellow) without human input. This minimized errors whenever spell values were adjusted. Images provided courtesy of Blizzard Entertainment, Inc.



The spawn placers, Andy Kirton and Steve Pierce, gave monsters paths to follow, things to say, and actions to perform. Wowedit showed their path (left) and the actions performed along that path (below). Images provided courtesy of Blizzard Entertainment, Inc.



July 2003:
Unexpected Giants

Carlo Arellano's cover art, July 2003. With advance notice, the art staff rendered a tighter cover illustration for the second CGW issue featuring our game. Image provided courtesy of Blizzard Entertainment, Inc.

The producers were rarely at their desks these days. Mark was busy establishing business relationships with European and Asian partners and

preparing for the upcoming launch, and that meant spending lots of time in meetings with upper management. Shane and Carlos were usually in meetings or were away from their desks. When the company moved Team 2 to a larger space, the producers moved out of the hallway and into centrally located offices for a modicum of privacy, especially for coordinating with outside partners. Gone were days of accessible producers sitting in the hallways, but everyone on the team knew what to do, and didn't need constant supervision. Oversight wasn't entirely absent, however, because meandering needed to be curbed to prevent unapproved features and content from delaying production.

One such issue was processing credit card information. Most options couldn't support the rush of Blizzard fans registering credit card accounts at the same time, and finding a package with a proven track record had become a daunting task. The only viable solution was prohibitively expensive. After evaluating every available commercial package, the technical staff gave up and decided to write the credit card processing software themselves, even though another major programming task was the last thing we wanted.

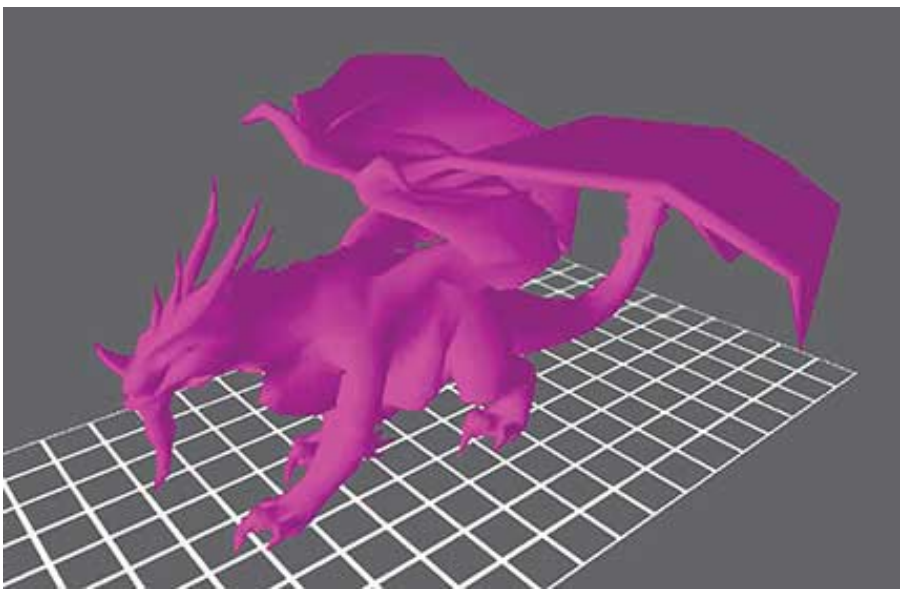
Since WoW had been public knowledge for a while, the announcement of the undead as a player race wasn't cool enough to secure another CGW cover story, so we spilled our guts about playable trolls, gnomes, and other details. We also welcomed the magazine's staff to our development area to play WoW for a few days. Jeff Kaplan sat next to them and answered questions as they tried out different classes, zones, and races. Jeff was a perfect representative because his experience of blogging about *EverQuest's* endgame made him sympathetic to concerns of the MMO audience and he could readily field questions ranging from the game's philosophy to its minute details. The visitors' enthusiasm for playing the game was encouraging, so we let them check out a couple of unfinished zones.

Mini-map functionality for interiors was implemented, which meant that people could readily find their way out of Stormwind and Orgrimmar. The monster spawners helped Allen Adham test a new combat system and balance class abilities. The designers were finally playing through the Deadmines, our first and only scripted and playable dungeon. The Deadmines had doors that exploded, and they were our first physical barrier to content in the game. Locked doors were a typical first-person shooter mechanic that made non-linear layouts more interesting.

The talent system design was declared finished (spoiler alert: it wasn't) and more trade skills and abilities were added to the game. The ability editor was mostly done, so there was nothing technologically inhibiting designers from creating their own spells. For the design staff, the Long Era of Theory had finally passed, as wowedit's robust tools allowed them to create real content. From this point on, designers were in the full-burn crunch mode of data entry.

The newest design tool was the NPC paper doll maker (see page 271). Quest designers and spawn placers finally had a streamlined interface that let

them mix and match pieces from different outfits, faces, and hairstyles to create new NPC combinations so the game would look less copy-and-paste. Before the paper doll tool, designers used wowedit's disparate array of dialog boxes, and the process was too time-consuming. It was like sewing together new clothes from scratch instead of selecting outfits from a wardrobe. Giving developers efficient tools was often a luxury in computer game development. Repetitive tasks are what computers do best, and requiring an employee to perform them is expensive, slow, and prone to both errors and low morale. Automation lets people focus on decision-making, which increases the overall quality and delivery of content…*if* the project has time to write the tools.



Dragon animations by Adam Byrne in the "previewer," July 2003. This screenshot was from our stand-alone model previewer, an application Team 1 wrote for their assets. It allowed developers to quickly locate and show art assets (props, visual effects, or creatures) without loading the entire game. Image provided courtesy of Blizzard Entertainment, Inc.

Another exciting advance was the dragon animations. Adam Byrne had been working on them for weeks, since dragons were by far the most complicated model in the game, and not having a dragon in the game had been a minor psychological annoyance. Seeing one walk and roar, even in a preview window, provided closure to many of the old-timers on the team, and we all felt a bit closer to the Promised Land of a finished product. Another reason the dragon made such an impression was that many of the developers (even at this late stage) didn't realize that gigantic monsters were a possibility.

A meeting for player housing was held, and strangely, designers, programmers, and artists were in full agreement that player housing shouldn't be included in the initial shipment. Although it had been done before in

MMOs, it never provided long-term gameplay and smelled like a dead-end system—one that got too little bang for the buck. We felt no shame in putting it on the back burner until someone figured out how to make it fun.

By 2003, we'd already had a small number of artists revising character designs since the beginning of the project some four years earlier. Whenever someone thought they could improve something, they did so and asked for opinions. The *Warcraft III* units were all rebuilt and retextured the same way at least a half-dozen times. Since character design was so important to an RPG, we were sparing no effort, and so far no one had said, "It's good enough." There really wasn't an official lockdown for the characters—when they looked good enough, the artists stopped revising them.

Originally, there were nine races intended for WoW; demons, goblins, and naga were supposed to join the six approved player races until the animators expressed how much work each of these three crazy races would need to accommodate armor components. It was hard enough fitting helmets onto tauren (with their horns), so reworking pieces over creatures with wings or without legs was prohibitively time intensive unless we drastically reduced the number of items a character could wear.

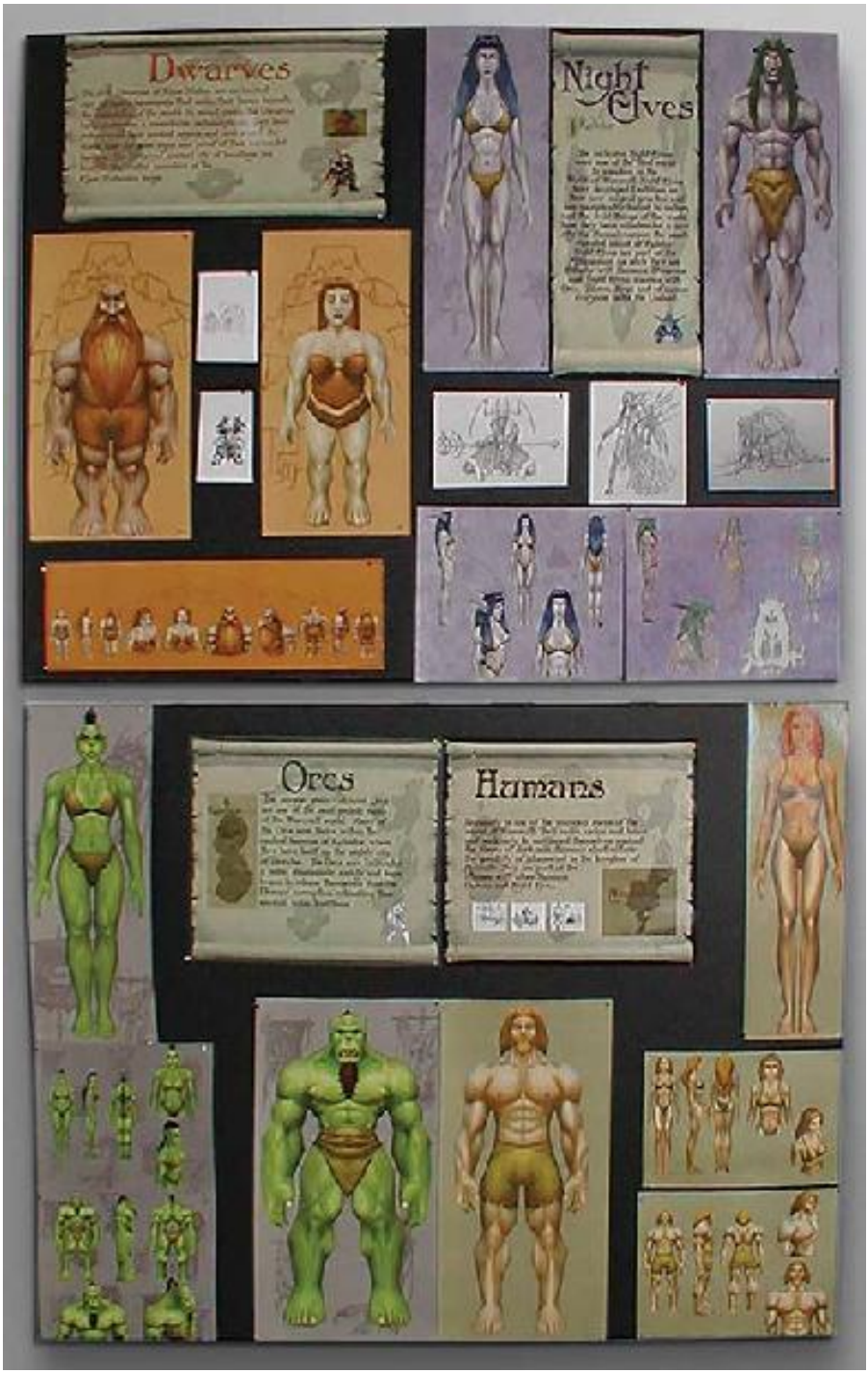
Goblins were too much work because we wanted them to be engineers and fill their world with machines. This steam-punk vibe would require building contraptions like locomotive pets, industrial weapons, and so forth. These assets wouldn't fit into non-goblin areas of the world, which meant we wouldn't get much reuse from them, so it wasn't really worth investing the resources needed to pull off a convincing goblin starter zone. The naga were a slithering aquatic race with a tail instead of legs, which invalidated armor pieces like leggings, boots, and capes. Chris Metzen wanted demons to be shape-shifters, which would definitely require too much work to support. In the end, these three races sounded cool, but the amount of work necessary to support them would easily triple the workload of the six other bipedal races combined. For a while, ogres were considered for a playable race. In fact, the reason players could put on a Gordok Ogre Suit in Dire Maul was because ogres had many player animations already finished. But it was decided the Horde already had the tauren as their large-sized character option, and no one wanted the job of making female ogres an attractive character, so we dodged the issue by abandoning them as a playable race.

"Everyone has the ability to draw."

— Artists Tom Jung and Carlo Arellano, explaining that the only difference between artists and nonartists is the amount of practice they invest

Character design was important, so we iterated on each race until the team generally liked what they saw. By the summer of 2003, Brandon Idol was redesigning the humans (again) based on Bill Petras's art direction and sketches from a half-dozen other artists. Brandon was one of the team's strongest character designers, although his work was often based on concept sketches from the rest of the art team. Brandon had some strong results when he built the tauren and the undead character models, but he and the other artists still tweaked the character models over the years of the development cycle. Everything was tweaked: hairstyles, color palettes, rendering techniques, painting styles, degrees of contrast, and light/dark values. It took an obsessive amount of effort to establish consistency from race to race, and it seemed like we got new versions of player characters every six months.

One of the major design considerations for character design was the silhouette, because players could then identify enemies and allies quickly by their overall shape and size. In games, the player's eye is usually overloaded with text, interface elements, spell effects, and targets, so it was crucial that players could quickly identify friendly or enemy races. This was especially important after it was decided to split the player population into two opposing factions, a concept pioneered by *Dark Age of Camelot*.



An early compilation of WoW character races by Derek Simmons, September 2000. The *Warcraft III* team asked the QA manager, Derek Simmons (who later become an associate game designer for WoW), to organize some of the *Warcraft III* races onto presentation boards

to hang in the hallways to preview before the digital pieces congealed. Shane Dabiri asked Derek to do the same for Team 2's artwork, and the result was the first four races. Neither the tauren nor the Scourge were approved as player races when these boards were cut out and pasted together. Image provided courtesy of Blizzard Entertainment, Inc.

Dwarven male character design, January 2003. As the human female body kits were polished, the human male and dwarf male variations were completed. Brandon Idol and Roman Kenney were responsible for most of the character design and refined each other's work. Brandon would do a "pass" on a character, then Roman would do one, and back and forth they went until both were happy with the result. Once a direction for the art was established, it was less subjective than people might think. Experienced developers knew how to pull apart the elements of art and explain the strengths and weaknesses of each other's work. Two veteran artists could respectfully build upon each other's styles instead of playing tug-of-war. After the dwarf females were done, they moved on to the Scourge (err, I mean the Forsaken). Image provided courtesy of Blizzard Entertainment, Inc.

August 2003:
Internal Alpha 4.0

Late nights had been suspended for a month to let people rest and play the new alpha after hours. The gameplay feedback suggested the new combat overhaul was heading in the right direction as employees played the Horde races, and at least at low levels, all the classes felt balanced, unique, and interesting. Some players even ventured into the (mostly unfinished) Wailing Caverns. Despite the company's positive reviews of the latest internal test, the reality of the workload had some of the developers feeling a bit down. There was so much work still left to do.

After playing the dwarven lands, people were eager to get trolls and gnomes animated and integrated into the game as player races. Programmers fixed bugs reported by the alpha testers, and designers continued to flesh out the trade skills, items, class abilities, and quests. The final cities of Ironforge and Undercity were top priorities for the friends-and-family alpha, which would hopefully begin in November. Aaron Keller, who had finished Ironforge, was delighted to see Matt Mocarski's texturing on the dwarf city, which was turning out to be gorgeous.

The Undercity was the only capital city not built by Aaron; it was tag-teamed by Jose Aello and Dana Jan, who established it in an incredibly cartoony (and exotic) atmosphere despite its subject matter (undead outcasts squatting in the sewers of a ruined city). I was secretly relieved they had volunteered for the job because I had zero vision for what could be done with it. The Undercity was a source of heated debate between Chris Metzen and the concept guys, as the layout had been initially sketched by artist Carlo Arellano, who'd wanted a hub with lots of stuff located in the center for ease of access. Carlo remembered pains in navigating Kurast, a city in *Diablo II*, and wanted to avoid unwarranted travel time. Unfortunately, a labyrinthine approach was exactly what Chris had envisioned. Carlo, Dana, and Tom Jung argued so much against it that Chris left the office visibly upset until he came back later and said, "Look guys, I'm sorry. I was an ass back there, and I now realize you aren't trying destroy my vision of what Warcraft is. You guys are trying to create something beautiful, and I'm the one that has to open my mind to what things can be." So Undercity was built with a hub that minimized cross-city travel.

Navigation was also improved by the extremely useful mini-map and world-map. They were the build's newest favorite features. We used them to navigate Dun Morogh, the newbie dwarven areas (we were so sick of playing

the first three human zones). Still, the 4.0 internal alpha seemed too rough to be used for the upcoming friends-and-family test, as the game would be played without the presence of employees. I was dismayed to learn that the same ice cave was used four times in Dun Morogh, but the producers reassured me no one cared about repeating layouts. I bit my tongue and gave them the benefit of the doubt. WoW was my first game, so I reasoned I was being overly sensitive and let the matter go until others confirmed my suspicions.

September 2003: A Sense of Place

We geared up for the friends-and-family alpha by purchasing more server equipment. The realms were spread across eight different machines working together in a refrigerator-sized rack of metal and silicon. The windowless facility running the hardware was only an hour away in Los Angeles. It used *Mission Impossible*-like security measures, complete with pressure-sensitive floor pads, self-locking doors, alarms, and locked cages. The warehouse-sized room contained rows and rows of servers, and 10,000 square feet of it had been cleared for our West Coast machines.

A new doodad artist had been hired to help out with the custom dungeon props; Matt Milizia's artistic and technical skills were only outmatched by his enthusiasm. It was great to have him on board. Matt later led the charge for making the Warsong Gulch battleground after seeing how big our first PvP zone was becoming. I assisted him by converting some of my old *Quake* "Loki's Minions Capture the Flag" levels into orc and night elf bases.

Another boon was reached after Sam Lantinga created active doodads. He named them "goobers," much to the amusement of the artists and designers, but the moniker somehow annoyed some of the engineers. Goobers allowed designers to turn any prop into something with game logic, adding functionality that was especially important for quests. The most elaborate example was the Uldaman doors. It remained to be seen if we would have enough resources to include many more animated cinematics like the door-opening sequence (spoiler alert: we didn't), but the artists spent time conceptualizing instance events anyway.

The team was burned out by both crunching late hours and the dispiriting amount of work ahead. Personally, I was working past midnight and dragged myself into work before 10:00 a.m. Saturdays and Sundays were when I'd catch up on sleep—which meant I worked only from 11:00 a.m. to 9:00 p.m. After seeing a couple of dungeons being played, I realized the play-spaces I was building *would* provide content for the game (and not be reworked or scrapped because of technological or design limitations). To me, Blizzard was a patron more than an employer, and building dungeons wasn't a matter of work; it was a matter of self-indulgence. I'm a nerd, and I loved making dungeons more than I did playing games. I had started making dungeons in my formative years, building environments for my *Star Wars* figures when I was a little kid. Those figures were ideal for eight-year-olds because they fit into small hands, had realistic proportions, and maintained a consistent scale. I built all sorts of temple layouts using sticks, rocks, wooden blocks, and books. I engineered trenches, prisons, fortifications, and living quarters throughout my childhood. I remember a construction crew once asked my mom if it was

okay that they knock over a miniature outpost I'd built on a dirt pile they needed (dirt piles were particularly malleable, like a giant wad of sculpture clay). The warren of fist-sized holes was so intricate the road crew apologized beforehand for having to ruin it. I didn't care, because once something was built, I usually moved on. I spent more time building than I did playing. When I got older I discovered *Dungeons & Dragons* and wrote homemade modules for my play group. Every term paper I've written was about castle construction or the anatomy of ancient architecture.

As a level designer, I detested the idea of repeating micro-dungeons across the landscape (as mentioned, "micros" were what we called non-instanced dungeons). Many people on the team figured players wouldn't care about seeing the same layout, since they were focused on loot and quests, and I certainly wasn't in a position to argue. But I still harbored my theory that players would get bored with recognizable layouts (the same way we grew tired of *Anarchy Online*'s randomized rooms).

My theory crystallized during one of our weekly board game nights. At these gatherings, a small group of employees would eat dinner while playing board games, a tradition Eric Dodds had maintained since he was in QA years ago. Participants represented a cross-section of the company including Kevin Jordan (our ability designer), Tim Campbell (a Team 1 level designer who had ninja'ed an orc campaign of interconnected maps into *Warcraft III*, despite being told by his producers it wasn't worth the trouble), Geoff Goodman (our monster and dungeon scripter), John Hsieh (tech support manager who also installed our phones), and Mike Schaefer (an IT staffer who installed and supported the WoW servers). After grabbing a quick dinner at a nearby restaurant, we took over one of the company's empty conference rooms. We often picked apart board game mechanics and discussed whether they were fun or how to improve them.

When the topic of micro-dungeons came up, John Hsieh admitted he had stopped going into the icetroll caves in Dun Morogh during the most recent internal alpha test after he realized it was just the same layout. Others in the group voiced similar opinions and it was all the confirmation I needed to redouble my efforts to get unique micro-dungeons into the game. Dun Morogh had four repeats of the exact same ice mountain cave. After a few weekends, I'd made unique variations by reusing textures and geometry, similar to how Roman Kenney had created new monsters by applying new creature geometry and textures to existing animations (it normally took a week to animate a monster). He did this on his own time, off schedule—we called these monster variations "Roman specials." In this way, Roman and I established ourselves as more valuable being off the leash of a schedule, or rather we did our scheduled tasks but also created additional content on the side.

My biggest problem was inserting my customized micros into the world. Customized micros proved to be a viable proposition only after rallying others to support me. Designers never turned down new art assets, and based on the

opinions I was hearing at board game night, the idea of varying micro-dungeons might be popular enough to tip the scales of decision. Jeff Kaplan was especially helpful in convincing the producers to give me the green light to replace duplicate layouts. When the producers were dubious about customizing so many micros, the game designers backed me up, testifying that I would be creating only a little extra work for them.

Placing dungeons in the world was the job of the exterior level designers and I wouldn't dare touch their zones. And I couldn't spawn dungeons with creatures, quest items, and mining nodes because I didn't have access to those tools, so I needed other devs to move spawns and nodes according to my new layouts. After getting support from the exterior level designers, the spawners, the quest designers, and Eric Dodds (who placed all the gathering nodes like herbs and ore), I went to the producers with the pitch. Carlos and Shane double-checked with every department to make sure I wasn't creating much more work for them, and luckily, they were all enthusiastic, especially the exterior level designers. By creating new caves, I'd also be making new cave openings which would make *their* exterior zones unique, and that's what made the exterior designers such strong salespeople for the pitch. They barely let the producers get a word into the discussion. The producers decided to turn me loose, and as long as I worked on weekends and during my own time, I could create whatever content I wanted, provided I understood that it might not be used. As it turned out, the only things that weren't used were a few unfinished crypts and wine cellars at the base of Karazhan. As soon as it became evident how customized micro-dungeons improved exploration, Shane had the programmers output a text file listing the names and locations of duplicate micro-dungeons in the world, making it easier to find and replace repeat offenders. Instead of having three caves and two goldmines, we had fifteen variations of each. Some were far too big, however. The Mulgore mines were so extensive, players grew past fifth level before they reached the end of the cave! And I've yet to meet anyone who's played through my "Temple of Doom" goldmines in the Blasted Lands. I even experimented with multiple entrances and connecting micro-dungeons together, such as the secret passage between crypts in Duskwood (by hiding black-textured geometry above the connecting passage, it was hidden from the black mini-map background).

October 2003:
Free Pizza and Other Hardships

Our next team-wide design meeting covered recent out-of-the-box design ideas. Allen pitched his idea of slowly revealing quest text that forced players to read the story. While some were dubious, he asked everyone to just give it a chance and provide feedback after trying it out. We were also going to explore limiting the size of guilds and the amount of time players could grind through levels. We didn't want an unhealthy game where people could lose contact with the real world, and decreasing the amount of experience harvested after six or so hours of gameplay would incentivize people to take a break. And our itemization philosophy had changed; the loot dropped by the monsters felt too repetitive and limited, so we borrowed from *Diablo*'s semi-random item generation and gave better items to vendors because players weren't using our merchants enough. Overall there was evidence that we needed more rewards and bigger loot tables. These issues and ideas were met with a tepid response from a team that was normally keen on Allen's ideas. Either his Jedi mind trick wasn't working, or we were too tired and grouchy to show enthusiasm. With most of the big-picture features and design pitches already known, the newest design tweaks weren't as motivational.

The producers maintained that our February shipping date was within grasp, and that too was received with skepticism. Sadly, their estimate conceded that achievements, player housing, and player-vs-player gameplay wouldn't be part of the shipped product. Shipping without PvP support felt like a failure to some of the team, although we understood the enormous cost of delaying our launch any further. PvP would need support for PvP rewards and a ranking system, as well as mechanics for balancing class, gear, and level disparities—none of which was even at the concept stage. After seeing our disappointment, Allen said that if we were going to do something, it had to be cool and would probably need more engineering time than we had available, and no one could argue with that. He then speculated that our PvP could embrace *Warcraft III*'s gameplay involving peons, goldmines, and bases, and that mollified everyone's disappointment over delaying PvP. Eric Dodds pointed out that someone had already done a mod of *Warcraft III,* called "Defense of the Ancients," that worked much like this proposed gameplay.

"We are nearly completely done for the most part."

—Twain Martin, database programmer

The team was back to working late nights, and I'd surpassed my threshold for pizza tolerance. For me, pizza wasn't just tasteless—pizza had become tasteless long ago—it had become *repulsive,* and I was at the point where I could no longer swallow it. Dinner usually came around seven o'clock, but the familiar stench sickened me, so I remained at my keyboard, leaving only when my hunger drove me out of my seat. I would grab a paper plate and stand in front of the open pizza boxes and feel my hunger abate. Without an appetite I placed the plate back down on its stack and returned to my desk to work. Other nights I left the building to forage the local fast-food restaurants. I wasn't alone. Over the years, the team had ordered from every pizza parlor within delivery distance, and yet we were still eating it twice a week. We no longer rushed to the conference tables after seeing the dinner caravan pass by our offices. The meal queue of famished devs had diminished to a trickle of indifferent patrons.

It was fair to say almost everyone was burned out by now. Morale was so low that the team, as a whole, didn't crunch. The artists didn't need to review their work in meetings anymore because everyone had the Warcraft look-and-feel down; they just moved from one art task to the next. Programming inched forward, mole-like, worrying only about the task immediately in front of them. Releasing the game in February didn't look likely anymore. That meant more time crunching and bug hunting, and few were happy at the prospect. The game designers had the functionality they needed, but wowedit's tools weren't streamlined because David Ray had been reassigned to working on the god tool, an application that would be used by our GMs for in-game customer support. Most of the designers were too busy to socialize. The classes and combat were getting overhauled again, and the item system was getting revisited by adding procedurally created items to keep the loot tables feeling fresh. This meant possible delays for the friends-and-family alpha test, and everyone was tired of telling their nearest and dearest that our game wasn't ready to play yet (and that they'd be the first to know when it was).

Even the producers had resigned themselves to the fact that we wouldn't be shipping in the first quarter of 2004. They were seeing stability problems, and we were having a hard time getting a playable build. This made things especially hard for the game designers, who needed to test their data, but no one was really coming down on the programmers, as they were already haggard. Nevertheless, when the game crashed, people were getting visibly upset. Our shipping date was pushed to June, although some people doubted even that was possible.

On a happier note, the NPC outfits were showing up in-game, and they

added a surprising amount of life to the world. The NPCs all looked different thanks to a couple of new world designers promoted from QA, Eric Maloof and Jennifer Powell. I knew both Eric and Jen from board game nights, and it was nice to see them on the dev team. Among the other tasks they were busy with, they were carefully placing all the nodes for all the flight paths between the zones.

Announcing the Korean–American Beta Test

Good vibes were coming from Asia. Although the simultaneous launch in both North America and Asia was a first in online computer game history, American gaming news sites didn't seem to care. Korean news did. When Chris Metzen went to Seoul to announce the beta launch for both markets, he was met with ridiculous furor.

How much enthusiasm? To grasp this, one needs to know a few things about gaming in Korea. Blizzard was like Disney but without the theme park; battle.net had become synonymous with the Internet the way Xerox and Q-tips are nouns in the English language. Top *StarCraft* players branded their own hair products and clothing lines. Blizzard was a more recognizable brand than Coca-Cola, and *StarCraft* was Korea's version of professional sports (in 2003, they had four television channels devoted to computer games). Cyber cafés (called "bangs") were more common than fast-food restaurants in America (a single city block could have dozens of them); Seoul had thousands of them. Cyber cafés were common hangouts where couples would date, play games, and socialize. So, while an impressive two-thirds of the entire country was broadband connected (the highest rate in the world), the cafés existed for convenience and community reasons. Even organized crime syndicates mirrored themselves into MMOs, extorting gold out of players, controlling game real estate, and generally carrying on as one imagines a cyber-syndicate would.

There were also fundamental cultural differences. Koreans seemed to have a different mentality; they were not as individualistic as Americans, and their reality TV shows didn't pit the players against each other, but rather had them cooperating in groups.

The Warcraft Dome, 2003. Inside, Korean Blizzard representatives answered questions from the press during the junket that kicked off *World of Warcraft* Korea Direct. Image provided courtesy of Blizzard Entertainment, Inc.

Chris Metzen accepts a gift of miniature swords. We were amused that Korean news websites accurately quoted him—"Holy shit! Holy shit! Holy shit!"—when he saw the swords for the first time. Image provided courtesy of Blizzard Entertainment, Inc.

Chris told the team that when he presented awards for a *StarCraft* tournament (our announcements were usually in filled stadiums where e-sports events were held) the winner showed respect by averting his eyes, looking slightly down. Chris, wanting to show respect to the tournament champion, tried to maintain eye contact by craning his head lower. That only prompted the award recipient to further lower his gaze. Soon they were both bending their knees in an effort to gain/avoid eye contact in front of cheerleaders, fireworks, and tens of thousands of screaming fans.

The announcement of the simultaneous American–Korean WoW launch was met with a mix of unreserved enthusiasm and ceremonial seriousness. The Korean stock market lurched upward with the positive news. We expected some negative press (in Korea, companies could subcontract journalists to write hit-pieces about their competition), but nothing happened.

Meanwhile, Blizzard employees only distantly knew we were working on "something famous." We'd either gotten used to or forgotten our worldwide renown. To us game development was still a job, a personal passion, and we were more focused on life's stupid things like where the producers were going to order our dinner.

Trade Skills

Trade skills were an interconnected web of recipes concocted from looted, gathered, and sold ingredients that could be activated by nearby trade skill objects or NPCs. Eric Dodds was the first designer on the team, and he had spent years planning the minimum necessary features and functionality required for the game's crafted equipment. Eric always got the most bang for his buck and only asked for features or interface elements that could be used in multiple ways. This approach minimized the need for programming and maximized the amount of content that could be made by designers.

The only outlier in the trade skill system that required special functionality was fishing, but it barely took Sam Lantinga a couple of days to code. Eric was especially nervous about fishing because it was the only activity in the entire game that could be performed without risk—and which, if hacked, could potentially warp the economy—so fishing couldn't actually yield anything valuable, especially in safe zones such as cities. So Eric made fishing a click-on-the-bobber mini-game requiring human interaction, which would hopefully make it harder for players to automate with hacks. Aside from fishing, other trade skills recycled functionality like merchant windows and collection nodes such as herbs, mines, and so on, so the only real difference between tailoring and blacksmithing was cosmetic—the internal mechanics were the same.

A lot of people imagine game designers as visionaries with their feet on their desks, dreaming up ways to play games. Admittedly, this is part of the job, but only a very small part. Designers spend most of their time writing design documents that no one else will ever read, in design meetings listening to producers/programmers list the ways the features aren't possible, doing mind-numbing data entry, and spending long hours fixing bugs. Game designers need to be good diplomats, salespeople, and communicators because they are very dependent on outside resources (code, art, etc.). Until the game can be prototyped (and played), coworkers have to take a designer's plans on faith. This is sometimes difficult in creative work environments, especially when other people want to do something else. In the end, game designers can't truly assess their system or game idea until much of the work is done.

For most of the designers, time on the project was spent pouring data into an array of entry points and testing until they were sure everything worked as intended. If they forget to check a box or input an incorrect value, the game won't function as intended, whereupon they retrace their steps to figure out what happened. If their data is correct and they didn't miss a checkbox, it means somewhere there is a bug in either the game or the editor, an engine limit has been reached, or a new feature is needed to accommodate the data. In these cases, they usually work around the issue or sit tight until a

programmer addresses the roadblock.

John Yoo was the game's item designer, promoted from QA to the WoW design team. He once lamented how his job entailed mere data entry because wowedit couldn't import item values from Excel. "Every day I only have time to enter the new damage values. That's all I do. I match damage values to the combat equations the programmers tweaked only the day before. Tomorrow, they'll tweak them again, and I'll have to input all the numbers for every single weapon. This has been going on for weeks and weeks. I don't even have time to make anything cool or think about balancing. If the game could read data from Excel, I wouldn't have to waste all my time inputting these values whenever someone changes combat equations." So, yes, there are pockets of game development that aren't creative or fun.

Another part of John Yoo's task was naming items—a chore with which Eric was also familiar. How many synonyms are there for the words *dagger* or *potion*? Since scores of similar items needed unique appellations, gear such as *shoulder pads* can challenge even the most thesaurus-savvy moniker makers. Still, there can be a lot of creative independence and ownership in item making, so it isn't an altogether unrewarding position by any means.

But wowedit functionality sometimes lacked features like autosaving, undos, and copy-pasting. To illustrate some of the more repetitive aspects of item creation, I've included Eric's step-by-step guide to making a single potion for WoW:

How to Make a Potion

1. Add an entry in the Alchemy trade skill progression spreadsheet.

2. Make the spell effect.

   - Make sure the spell effect doesn't duplicate other class or trade skill abilities.
   - Make sure the effect is balanced for the intended level of effect.
   - Create the potion item.
   - Price the item so the player doesn't lose too much money when they create it.
   - Choose an icon.
   - Set the "cooldown" time of the item to the appropriate cooldown category.
   - Give it an internal name based on a set of search rules.

3. Create the recipe that "creates the potion."

   - Make sure that the vendor's reagent cost is reasonable.

- Verify the player cannot make too much money making this recipe.

4. Create the effect that “teaches the player the recipe.”

   - Copy and paste from another teach recipe spell and change what you learn.

5. Add the potion recipe to the alchemy skill line.

   - Set the chance for advancing the alchemy skill whenever the potion is created.

6. Create an item that has the “teach recipe effect.”

   - Price the recipe item appropriately.

   - Set the minimum skill level that is required for the player to learn the effect.

7. Create a vendor table with the item that teaches the recipe.

   - Set the restock time and the percent chance the item is found.

8. Find appropriate merchants in the world who should have the recipe on them.

This process was similar for all 150 alchemy items, a trade skill that was comparably easy to implement. Luxuries like copy-and-paste were usually a grayed-out option, and a lack of auto-saves made crashes more painful.

November 2003: Friends-and-Family Alpha

After many delays and weeks of broken builds, the friends-and-family alpha test finally went off without a hitch on November 11, 2003. Around five hundred lucky pals and significant others downloaded the two-gig test and jumped into the game, playing only three human classes with a level fifteen cap. By the end of the month, the dwarven zones were also tested and the level cap was raised to twenty-five. The game was finally accessible to our friends, who could now see what we had been working on for years. The servers averaged around two hundred simultaneous players at a concurrency rate of almost 50 percent. That was much higher than we had expected, but we incorrectly assumed our friends would play much more than the average Blizzard customer.

The alpha yielded over a hundred pages of suggestions and bugs submitted, and the developers ground through them during and after the test. The overall response was incredibly positive and was a much-needed lift for the team's morale. So far there was really nothing that felt wrong about the game, and most of the suggestions were in the direction the game was already heading, with players only wanting more, so the validation felt great. Although there wasn't a release date within sight, the workload wasn't daunting anymore—the game was playable. Developers were beginning to get a sense that something had been accomplished. The mood on the team grew upbeat, and it looked as though it would remain so until the release of the game (spoiler alert: it wouldn't). And people noticed that the programming tasks listed on the whiteboard weren't scheduled for an alpha test—they were for public beta.

One of the amusing things about the feedback was how the players discovered ways to *cheese* the game and grief one another. There was a certain thrill in the act of discovery or out-guessing the game designers, so participants proudly reported exploits, since they too felt like they were a part of the polishing process. With the limited amount of available content, some players spent their time actually looking for bugs!

Testers were finding ways past the sky-high invisible walls and killer guards, to gain access to areas they were not supposed to go—and they cheerfully reported "errors" in these unfinished areas. Some explored the oceans, either drowning or dying of fatigue, while others circumnavigated the continental coastlines. As abuses, cheats, and exploits were reported, we rolled up our sleeves and stamped them out. In every way imaginable, the F&F alpha test was an unmitigated success.

Friends-and-family alpha webpage, November 2003. Including news and a forum, this webpage kicked off the nascent WoW community. Image provided courtesy of Blizzard Entertainment, Inc.

Log-in screen by Aaron Keller, December 2003. Only when the F&F alpha test was on our doorstep did we realize we didn't have a presentable log-in screen. Aaron Keller's 3D Studio Max skills were some of the best on the team, so he was given the chance to compose art assets to create the game's "face." Everyone offered him their unsolicited creative input, and soon the plum task became an unwanted burden. Aaron was too nice to say, "Please leave me alone," so he listened to everyone's pitches day after day for weeks on end. Artists submitted sketches, and Bill directed the art decisions. Some artists sketched over a dozen pitches. Even Chris Metzen (who rarely emphasized details) came by our office to unload his history of the Titans. Chris cared more about the Titans than anyone else, and since he lost the battle of making the WoW cinematic about Warcraft's cosmogony (instead it had focused on characters and races), he eagerly pitched the origin of the Warcraft universe to be the focus of the log-in screen. Image provided courtesy of Blizzard Entertainment, Inc.

December 2003: Stepping on Toes

The month of December was traditionally a dead time for development, but the excitement from the F&F alpha had charged up the team. Because fewer people were going home for the holidays, things were getting done faster than usual, although none of the departments had finished their tasks for the public beta. Programming still had a heavy workload, and content creation seemed like it would never be over. Artists and animators would always be needed to make more monsters and props. Designers were still thundering headlong into the game, fleshing out gameplay with details, while the dungeon team built their play spaces with greater confidence. As the F&F alpha moved its focus to the undead zones, players began testing features such as enchanting and fishing, and they saw the beginnings of in-game cinematics as camera fly-throughs introduced each newly created character. After people played the Deadmines, we got a sense of how long a good dungeon-crawl should be. Many dungeons were expanded to at least match the size of the Deadmines, while the higher-level dungeons were enlarged well beyond that.

The F&F alpha reached a new record of 316 concurrent players as more friends of Blizzard employees were given access to the test. We planned to evaluate everything until the beta's programming tasks were finished, at which point we'd start inviting fans. For the public beta, we wanted the game to feel finished—or at least to the high standards to which Asian players were accustomed. Theirs was a benchmark Blizzard didn't want to miss. Based on the test feedback, our response, and the team's ability to move forward on new tasks, we guessed we'd need at least six more months to really test the game before we shipped. That meant we would miss our deadline, which was recently pushed back from February to June, by at least three more months.

Because we had granted access to off-site alpha testers, we were able to measure, optimize, and cut down on our bandwidth usage. This was very important because Blizzard was charged for the amount of bandwidth the servers were sending the clients, and after our customer service costs, bandwidth would be potentially our next biggest expense when the game went live. Currently, we were sending only 1.7 kilobytes a second, which was less than a tenth of what other MMOs used.

"I'm a programmer. I can push around the producers, but the level designers won't listen to me."

Veteran programmer Collin Murray described Jeremy Wood, whom we hired straight out of college, as "a guy who is scary-perceptive for someone who's never worked before." It's a universal perception that level designers don't listen—that we build however we please, regardless of limitations set by the programmers. But let me take this opportunity to offer a bit of defense for my fellow level designers: We listen, but we also have other considerations. We're the center of development's Venn diagram. It's our job to make locations render smoothly; while telling a story; while making the world beautiful and immersive; while providing areas suitable for gameplay. In serving our varied masters, we sometimes forget our limitations. When we discover something cool, concessions often must be made. Sometimes our hacks create more work for other departments, who help us pull off our tricks. It's a balancing act of robbing Peter to pay Paul.

For instance, I once butted heads with the programmers over transparent water. Our opaque water wasn't popular with the art team, and it prevented me from seeing my submerged temples in Blackfathom Deeps. I'd asked repeatedly for transparent water tests, but the programming staff said they were swamped with higher priorities and didn't have time to fix "sorting issues"—which were graphical glitches when multiple transparent objects appeared in front of one another. If spell effects (which used transparent textures) were cast in front of transparent water, they would appear to be underneath the water's surface. Not good, right? And sorting issues were a messy video card problem, and since all video cards worked differently, it was a major pain in the ass to correct.

However, I wasn't convinced. I scaled-up one of our props that used transparent textures and used it as a mock waterline to see how bad sorting would look—and the result wasn't bad at all. The sorting issues were only noticeable when I channeled from the shoreline into the water. The "ribbon" VFX hiccuped when they overlapped the water, but it was utterly unnoticeable in the heat of combat. The entire dungeon team was so excited that we showed the producers, and Shane gave me his thoughts. "John, I know you're super-excited about this, but you have to let us handle it," he explained. It was a delicate situation, and he just wanted to be the one telling the programmers they were wrong. Everyone had been working late hours and Shane didn't want to upset anyone. "I promise you," he continued, "we'll implement transparent water, but it might take a little time. Please, don't tell anyone else." Shane was talking to me like this because I had a reputation for being a ninja and sneaking things into the build of the game that weren't approved or on a task list. I'd always earned autonomy in the workplace by

working longer hours than anyone else—and my situation at Blizzard was no different. I established a gentleman's agreement with the producers that I could build extra dungeons on weekends and after hours if I completed tasks already assigned to me. I found trust like this to be liberating and empowering, and it generally made my time on the job more comfortable. I ended up making so much content, the game designers urged the producers to treat me with a hands-off approach. Because I worked on whatever I wanted, people often came to me if they needed something major to be improved—or ninja'ed in. Since the producers were wise to my ways they always kept an eye on me to make sure I wasn't creating work for other people.

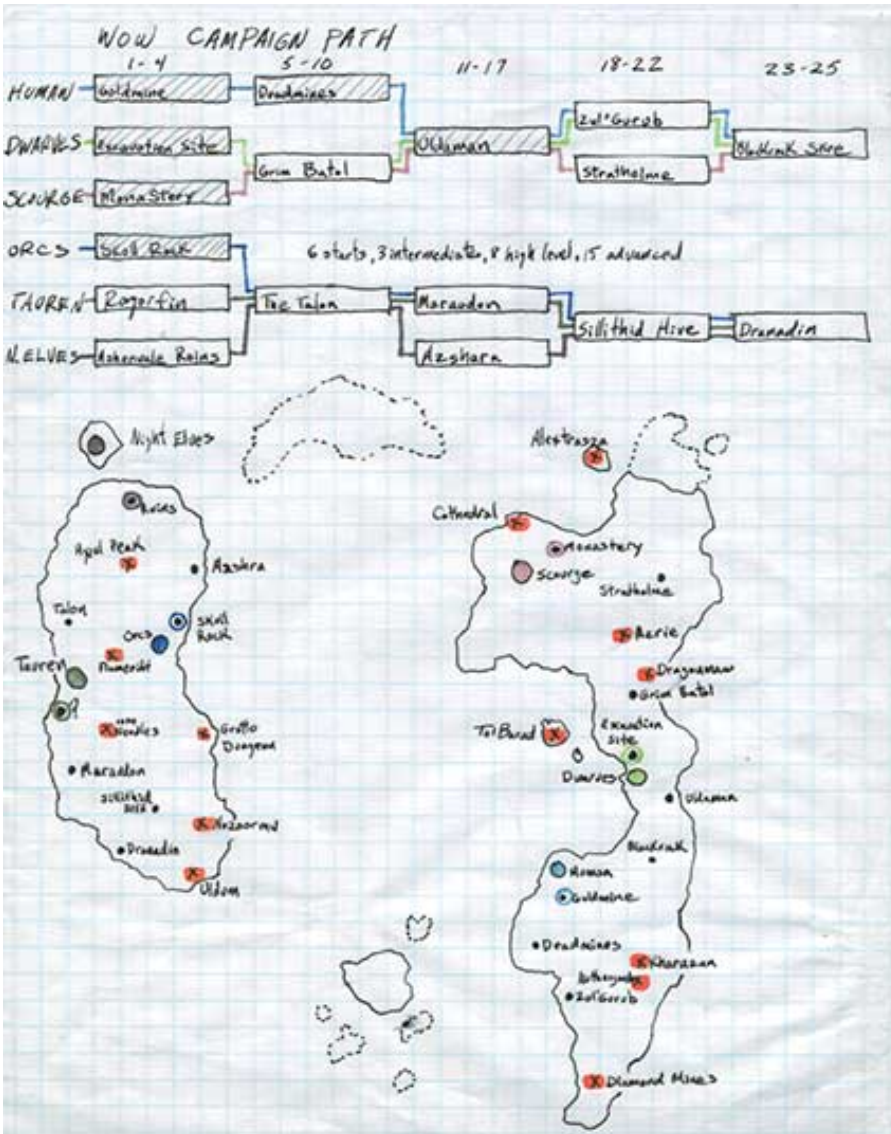
But transparent water was a different story. This time I had gone behind the backs of programmers after they had doubled-down on insisting that they didn't have time to fix sorting issues. In truth, the programmers were correct—there *were* sorting issues, but what they didn't realize (and what my test had demonstrated) was that the sorting errors were mostly unnoticeable. Aside from myself, the programmers were working longer hours than anyone else on the team, so reversing one of their vetoes would be a touchy prospect. Shane was perfectly reasonable in wanting the news to come from him instead of a rabble-rousing level designer. I certainly didn't want the heat, so I let Shane add the task to the programmer's workload in his own time, and I promised to keep my big mouth shut. But what Shane *didn't* do was tell the other level designers the same thing, and they promptly blabbed about the discovery to half the office. Later that day, a group of artists came over to my desk and insisted that I show them this Promethean miracle of transparent water. I protested, but they weren't having any of it. They told me the whole team already knew and crossed their arms, saying they wouldn't leave until I showed them. I relented just to get them out of my office. And wouldn't you know it, Shane walked into my office at *exactly* that moment. Before I could get a chance to explain what had happened, he walked away, shaking his head in exasperation. That should illustrate what it was like to work with level designers. We are troublemakers by nature. We spend so much time on a single file or area that sometimes we become too fixated on forcing things to happen.

I've always found case-by-case problem solving yielded better results than fiats coming from department leads who didn't quite realize the whole "robbing Peter to pay Paul" thing. For instance, I ignored our object size limits while building the thorn canopies for the Razorfen dungeons. After Scott Hartin informed me why the engine couldn't handle my giant canopy I built it a different way and he subsequently gave me a different veto. Over several weeks we went back and forth until eventually we ended up working out the problem together (Scott tweaked the code to make an exception). The result was that Chris Metzen's vision of being inside a giant thorn bush was realized.

And I wasn't the only one making waves. When Aaron Keller was told

we couldn't place freestanding buildings directly on the terrain for complicated pathing code reasons, he placed tepees and tents in Thunderbluff anyway, and we discovered that the pathing problems weren't as bad as initially feared. Dana Jan built his Deadmines bigger than our engine's "farclip limit," which forced programmers to increase it—and we learned bigger rooms *didn't* produce performance problems. This proved to be a valuable lesson for creating "epic" areas.

As ornery as the dungeon builders were, the exterior level designers were worse (or so we were told). The programmers were so frustrated by the overuse of props in some areas (which deteriorated the engine's performance), that they often went to the producers to arbitrate compromises. Butting heads was a good thing; it meant employees were passionate about their jobs, new things were discovered, and the game's limits were stretched with coolness.



Original dungeon plan, January 2001. I wrote down Chris Metzen's dungeon wish list long before we had any dungeons in-game. The old plan was a unique campaign path for each race. The orange *Xs* on the map denoted non-quest dungeons that were generally for advanced (high-level) adventuring (this was before we decided to use instancing). Notice the level ranges went from first to twenty-fifth and the names of the dungeons have changed. The dungeon list was ultimately decided by the amount of content that could be made, and happily we made the first MMO to have too much content. Image provided courtesy of Blizzard Entertainment, Inc.

Dungeons: The Last Hurdle

Dungeons had long been a problem for Team 2. Blizzard wasn't known for building 3D environments, and attracting talent to the project had been especially challenging. Despite the perennial job listing for 3D level designers and texture artists, the number and quality of candidates were meager. In an effort to find more level designers, I combed through maps in the FPS mod community. Every week I sent a dozen quality authors to Derek Simmons (who, at the time, worked in HQ as the company's recruiter in the guise of Jack Sterling, the ongoing pseudonym of our internal headhunters). Derek solicited at least sixty level designers, yet only a few of them ever showed an interest. Many were either working somewhere else in the industry (and earning much more money), didn't want to move to Orange County, or were from a foreign country (federal laws made it difficult to hire non-Americans). Blizzard just didn't seem to be a place where 3D level designers wanted to work. It was even harder finding texture artists for 3D levels. We paid less for 3D level designers because the salaries were scaled to what our 2D level designers earned. But matching salaries of 2D and 3D level designers was a mistake because making 2D RTS levels was a scripting position and didn't draw from a specialized 3D art skillset that took years to master.

Mistakes like this aren't uncommon in game companies, who often don't know what to do with level designers. I was interviewed by Rob Pardo and Eric Dodds, and we talked about design, yet I was hired to the art team. After WoW shipped, I was moved into the design department, but distance from the art department made it necessary to move me *back* under the art umbrella. I personally thought 3D level design was a design role that required artistic talent, but the sheer disinterest most of the dungeon team showed toward design, layouts, or even playing dungeons made me feel as though I was the only designer on an environmental art team. This was especially frustrating when it came to reviewing dungeons. And because dungeons couldn't be reviewed in-game, neither art nor design leads could easily keep tabs on what the dungeon department was working on. Unfortunately, some dungeons resulted in rejection after months of work was lost.

A good example of when things didn't go well was Karazhan. After I spent six months building it in Radiant, we decided it would be better to build dungeons using 3D Studio Max. Starting from scratch, Jose Aello renewed the project a year later, and took it to heart to follow Chris Metzen's direction that the tower be super tall and slender. After a few months' work, he presented a fully textured version to the game designers. Again, they hadn't seen it sooner because there weren't any game designers in charge of dungeons because they weren't yet playable. When they evaluated Jose's work, all the rooms were too narrow for combat, and half of the real estate was devoted to stairs (which were bad for gameplay). The entire thing had to be scrapped because it lacked

playable combat space.

A year later, work on the tower started again with a kick-off concept meeting that ended with the idea of disconnected towers floating around the center spire. After the morning-long meeting, the programmers put the kibosh on that idea, saying the pathing data couldn't support complicated moving structures (this was before ships and zeppelins were functional). Months later, Karazhan was back on my plate, but this time the game designers made it clear to me they needed something with a ton of space because they wanted it to be a raid dungeon that was "as big as upper and lower Blackrock Spire combined." Unfortunately, when this request was made, we hadn't played a raid yet, so I sketched out a dungeon that was far too big. I made the floor plan so massive that Aaron Keller (our city builder) took over building the interiors while I built the outside shell. I also built another raid dungeon located at the top of the tower (where players teleported to a floating asteroid filled with demons). Aaron even expanded the tower downward, adding flooded sub-levels. In addition to the gigantic tower, I built several undead catacombs and wine cellars around the town that were never finished or used. By the time Jeff saw how big the dungeon was (especially the gigantic library), he told us to reduce everything because we'd gone too far. We cut Aaron's flooded sublevels, the raid at the top of the tower, and the unfinished micro-dungeons around the structure, but it was still too big. And this all happened at the very tail end of WoW, when we had discovered that marathon instances weren't fun and, for the first time, the phrase "too big" was used. Despite the problems with Karazhan, the environment team did a wonderful job on the final version. Brian Morrisroe and Jimmy Lo provided textures and concepts for the exterior, while Matt Mocarski fleshed out the interior with textures.

More problems were in store for Karazhan when it was placed in Deadwind Pass. When Matt Sanders, the exterior level designer in charge of the zone, placed the tower on the terrain, he discovered the top of it surpassed the game's farclip setting and it looked like the top third was missing. Matt resolved this issue by sinking the tower into a valley behind a ring of mountains. The path to it was elevated to the structure's midway point—which halved the distance between the player and the building's extremities. Farclip problem solved! The vantage also gave cool views of the town built around its base.

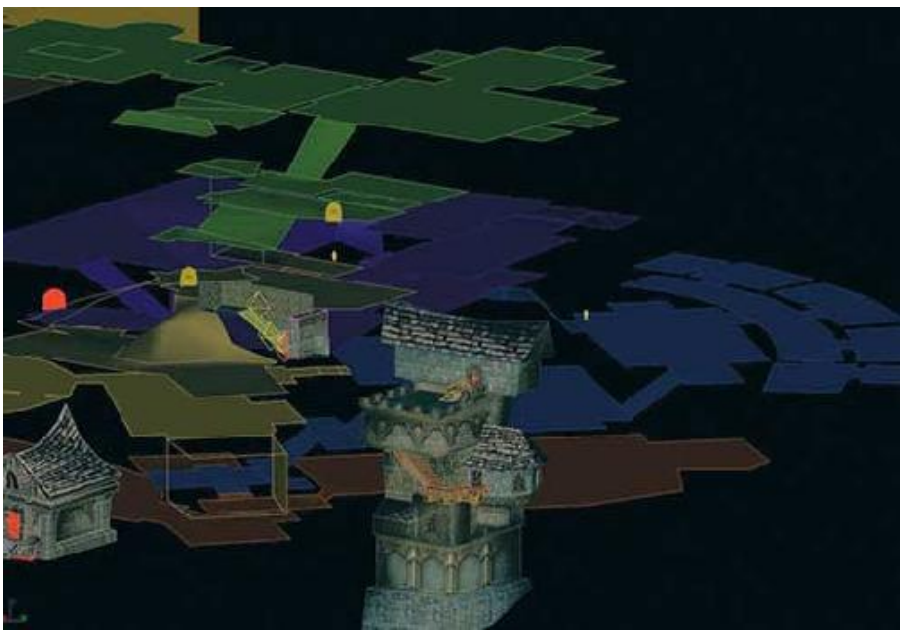
Building cool vistas was also important to interior level designers. We framed interesting panoramas whenever the chance arose, often rearranging layouts to achieve these compositions. The interior team even joked that "nobody even looks up in the game," which was where the most of the interesting architecture happened (e.g., ornate arches, soaring cataracts, god-rays spilling light through an oculus, etc.) because the floors usually needed to be clear for gameplay.

Dungeon artists have to pat themselves on the back for a job well done, as

forum comments rarely talk about how environments look. Players never wrote, “It’s so cool on Shadowfang when you can see the town below,” or “The high Ironforge ceilings feel like an underground city,” or “The ogre juggernaut at the end of the Deadmines was a cool surprise.” The discussions were inevitably about the value of the boss loot. Players focused on in-game rewards that took mere *hours* to create!

After the 3D model of the dungeon was built, it was handed over to the texture artists. Depending on the subject matter, painting the textures sometimes took as long as it did to build. Once textured, dungeons were lit and propped with doodads, which usually only took another few days. Dungeons were constructed in a case-by-case basis and ranged from two to nine months’ worth of work. Each had their own set of problems to solve: some technical, some artistic. In every case the goal was to make it feel *epic* —the watchword of the project.

Finished dungeons were placed into the world by exterior level designers and scripted by the game designers. Jeff Kaplan and Geoph Goodman kicked off boss fight meetings where both spawners and game designers invented boss mechanics and decided the makeup of the monster population. After the monster spawns were placed, the quest designers did their part to instill a sense of lore and history into each location.



Karazhan layout, November 2004. This rough 3D sketch shows the dungeon’s connectivity and size (although it was greatly reduced before being released in *The Burning Crusade*, the game’s first expansion, in 2007). More than one dungeon had been scrapped, and almost all had gone through major revisions before going into the game. Image provided courtesy of Blizzard Entertainment, Inc.

January 2004: One Year Left

The producers gathered everyone together for the first team meeting of the New Year to keep us abreast of the game's progress. Mark Kern reaffirmed we had punted on player housing until after launch, but the designers were working on a large-scale PvP battleground, which they were hoping wouldn't be difficult to implement. They had been working with exterior level designer James Chadwick on size tests of a PvP zone called Alterac Valley. This zone would offer a whole new way to play WoW, and the plan was to create enough variety in gameplay that players who didn't want to directly confront enemies could still contribute to the war effort by farming monsters that would eventually unlock NPCs, which could turn the tide in the forty-vs-forty battle.

In the meeting, Shane Dabiri congratulated the team on its progress and read a list of accomplishments on a game that hadn't even been in a public beta yet. The list included WoW's production figures:

> 150 unique monster models/animations with a dozen left to do; with texture variants, the count rose above 500.
>
> We were over halfway to our goal of 200 unique player outfits, each with color variations.
>
> 227 unique weapons, each with different color and enchantment effects.
>
> 300 unique spell graphic effects and hundreds of spell sounds.
>
> Over an hour of music and 62 different ambient zone pieces, 324 combat sounds, and more than 1,000 monster sound effects.
>
> The world was tiled with over 200 textures and 4,200 unique doodads (or props).
>
> 400 dungeon objects (including buildings, bridges, and large structures) that shared 5,000 textures.
>
> 1,500 icons including the interface artwork.
>
> 2,600 unique NPC outfits.

It was no surprise that the Christmas holidays had delayed our next alpha test and pushed the Kalimdor starting zones back a couple of weeks. The company alpha test was more helpful than we had imagined—the bug and suggestion log *for just trade skills* was over seventy pages long in nine-point type

(amounting to about twenty suggestions/bugs per page). And this was just the feedback from the month of December from only a few hundred users. The printouts for quest feedback was even longer. A six-month beta looked increasingly unnecessary, and the producers' suggestion to adjust the schedule wasn't met with resistance. With hard work and focused concentration, a release in June was possible…until we received two bits of disconcerting news.

The news of the first leak of WoW broke at the turn of the year. Someone from the friends-and-family alpha test broke the NDA and had distributed the client package of WoW. Screenshots and movies of people running around the game were available online. This was something we were prepared for, but the time it took to track down the culprit (it was someone in QA) had slightly distracted the programming staff. Since most of the zones of the world had been kept secret, the leak dampened our ability to provide reveals or exclusive screenshots, as well as showed off the world we'd worked on for five years in a very humdrum way.

The second shock to the team was the announcement that Allen Adham, our lead designer, was leaving the company for personal reasons. Allen's passion for computer game development had waned over the years, and he had been showing up to work infrequently in order to force his design staff to make decisions without him. Rob Pardo, the design lead for *Warcraft III*, was taking over Allen's position. Rob had been very active in the daily design process of WoW (mostly during lunchtime conversations, e-mails, and meetings with Allen) and he had helped set the direction in which WoW was already headed. Rob's transition to Team 2 would probably affect the schedule, so a June shipping date was definitely looking unlikely.

World-maps, December 2003. Before Ted Parks's art for the world-maps was approved, the continents were represented by zone captures created with a little

tool called Mapstitcher. Although they were useful and functional, they looked like satellite images and didn't fit the fantasy genre. Mapstitcher provided a stencil for Ted to create his artwork, so the final product accurately reflected the world's size. Notice that the bottom of the left continent, Kalimdor, is unfinished, as the worldchunks that made the terrain hadn't been created yet. Image provided courtesy of Blizzard Entertainment, Inc.

The test to push three Horde races at once saw over five hundred concurrent players. Our servers were stable, and that was good news because we were predicting each realm would average about two thousand concurrent players. Blizzard was limiting the box sales in Korea and North America to 400,000 because our hardware on each continent could only support 125,000 concurrent players. This didn't sound like many to the team, but conservative sales were better than overloaded servers. Besides, WoW was a subscription-based game, and we didn't expect a demand as high as that for a free-to-play game like *Diablo*. Affirming this theory was far fewer preorders for WoW than for previous Blizzard titles, so it was looking as if we wouldn't be overloaded at launch.

Blizzard's producers often referred to a "Times Two Plan" if the number of people connecting to the game was much higher than anticipated. The Times Two Plan would accommodate a concurrency that was double the maximum concurrency that any MMO had ever achieved (15 percent of user base), which meant we could theoretically support 30 percent (spoiler alert: we launched at 90 percent concurrency and never fell below 50). As Joe Rumsey massaged the server code to optimize performance, he addressed questions about stability on the WoW alpha forums and explained how many CPUs were needed to support one realm:

> "The single machine the user server is on right now is at about 10% CPU utilization with 480 clients logged on, vs. 80% at 520+ players previously. The entire realm consists of 8 computers, each with 2 CPUs, so 16 CPUs total. Of that, 4 CPUs are set to run user servers. Azeroth and Kalimdor are also 4 CPUs each. The remaining 4 CPUs are for instances."

A detail of Hillsbrad Foothills, provided by Mapstitcher, shows the first “real” PvP zone during the public beta test. The area was popular because of the short distance between cemeteries (which meant quick corpse-runs), and the rivalry between the Tarren Mill and Southshore erupted organically as the Horde and Alliance players “ganked” each other in quest areas. Reports of ganking drew in more high-level players to defend the contested territory, which resulted in a full-blown battle line with hundreds of players seesawing back and forth between the two towns. The town guards proved to be ineffective in repelling the attackers, so the designers made them more powerful. Image provided courtesy of Blizzard Entertainment, Inc.

February 2004:
New Hands at the Helm

The week-long beta sign-ups in the US and Korea came and went. In total, 266,000 American players and 88,000 Koreans registered to play the WoW beta. While the US numbers were strong, the Korean applicants were enigmatically lackluster, especially after the fanfare of announcing the simultaneous American–Korean launch. We didn't know why so few had applied for a free beta. Other indications pointed toward high engagement in the Asian market, so we didn't know what to expect.

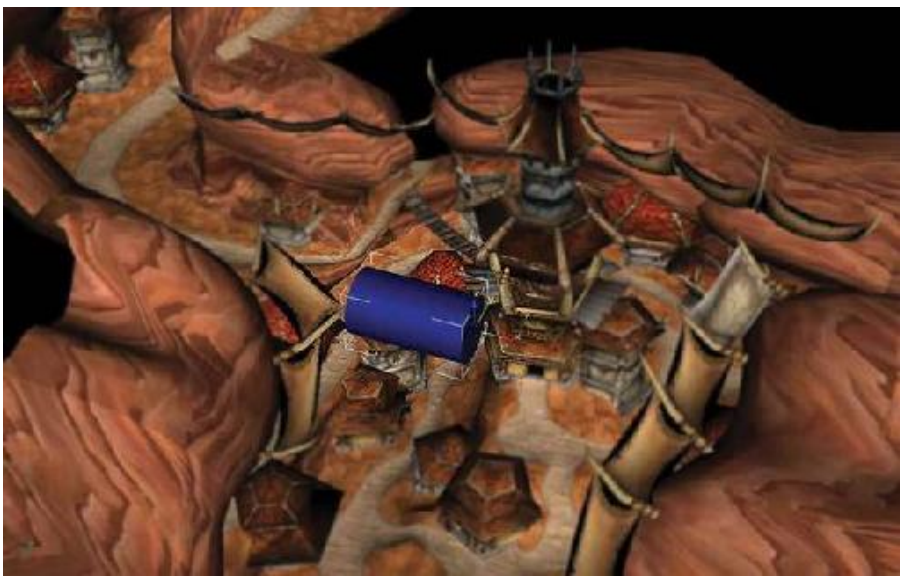
Since January's team meeting, the producers had been working with the new lead designer, Rob Pardo, on hammering out a list of features that were must-have for shipping the game. Week after week they were in meetings with all the departments outlining the dev team's capabilities and estimating our new ship date to be September 15. Rob discussed design plans for PvP, vehicles, capes, a new death system, mini-map functionality, revamping talent points, redefining and balancing character abilities, expanding the dungeons, reevaluating experience distribution, hero and multi-classes, guild raid content, and adding more character customization options. The list of intended features was long and seemingly unrealistic for a team so fatigued by the past years' effort—but they all sounded like good ideas. The producer's schedule was a bit ambitious, but the September 15 deadline was the first hard date the team had ever discussed…however, we still couldn't tell if we were near the top of the mountain or if there was yet another rise over the ridge. One thing was true: We were exhausted and sick of WoW. We worked on it all day, played the test on weekends, and talked about it over every lunch and dinner. When we talked to someone outside the company, it was often the only topic of conversation they were interested in.

It was decided for the last two weeks of February the team would work only forty hours a week—late nights would return again in March. But some were working those hours anyway. For the most part, morale was low among half of the employees. Some were doubting that our workload would subside after shipping, because there would be so many bugs to fix and pressure to create more content. With the game still unfinished, and with the imminent expansions and live updates ahead, we were beginning to wonder if we were ever going to reach a conclusion. The team's spirits were somewhat buoyed by the enthusiasm of the design staff, who were coming in to work on weekends. But even the designers agreed that they never wanted to work on another MMO. They were just too hard and too risky, and took too much time and effort to make.

To help with the content workload, we quickly interviewed more quest designers. In early development, we had estimated WoW would only need

one person to implement all the quests—but the process of writing, scripting, testing, and debugging took so long our four-person quest staff needed to expand, especially since we learned that better quests took more time to create.

Blizzard was also assembling support for the game. We hired our game master staff officers and were getting ready to interview candidates for the actual GM roles. Already a handful of the GMs were preparing for the planned March beta test by ordering and laying out desks and cubicles. There were plans for over a hundred GMs in both the American and Korean locations who would help players around the clock, seven days a week. Blizzard was also hiring billing representatives to handle the bookkeeping and increasing the size of the overworked IT department as well as server staff to maintain the hardware needed to run the game.



Size matters! A running joke in the dungeon department was how “mighty” things needed to be. If something needed more “mightosity,” we just made it bigger. I scaled the cylindrical volume (my blimp placeholder) in 3D Studio Max to see if I could fit a zeppelin inside Aaron Keller’s orc city. (It didn’t have enough room to maneuver, so we moved the zeppelin platform outside the city.)

Big things presented scale problems. The interior designers had to answer questions such as: Would it be odd if the interior of a farmhouse seemed small even though its exteriors were big? This had been an issue earlier in the project, and the art team was concerned because Warcraft III proportions were reversed—the players were big and the buildings were small. As the project aged, we got used to our disproportionately big buildings and trees; they became the look—and not eyesores we needed to fix. Image provided courtesy of Blizzard Entertainment, Inc.

March 2004: Public Beta 1.0

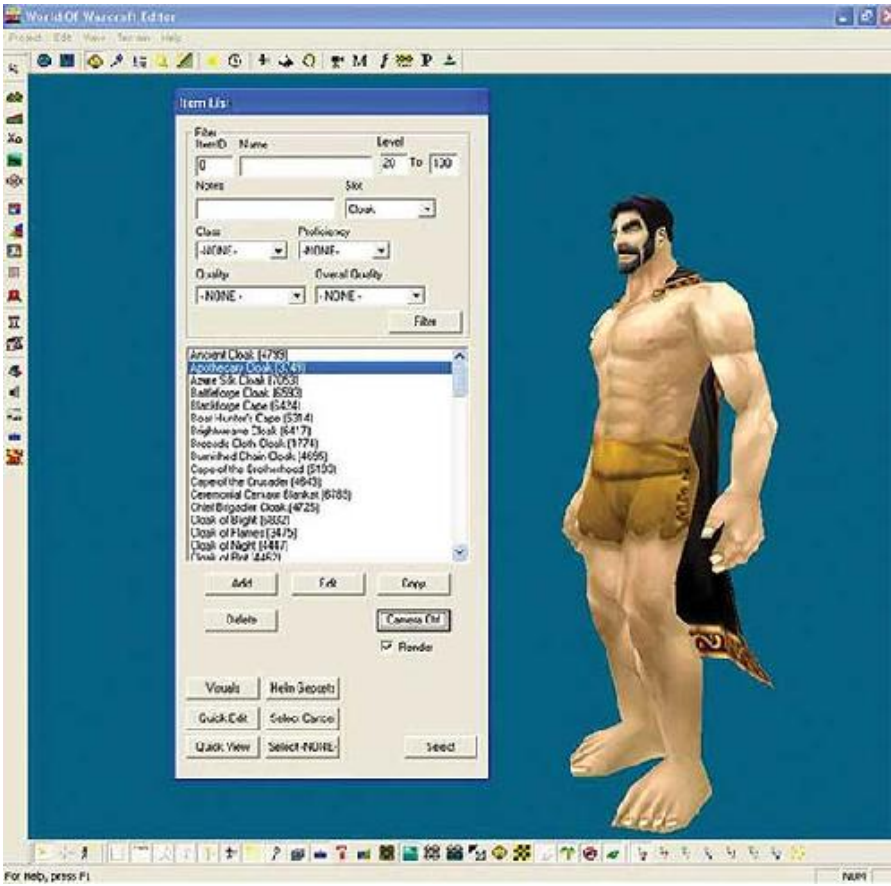
On March 16, 2004, all testing showed that the server hardware, downloading processes, and accounting system were working without a hitch. Beta test readiness was the culmination of months' worth of preparation by several of the programmers and producers on Team 2. Since the designers' overhaul of the combat and skills systems had rendered the daily build unplayable, it was decided to just use a month-old version of the game for the closed beta. The fans' expectations were high because every hands-on article had exulted WoW's polished feel, and reviewers claimed that "it felt finished." This, coupled with Blizzard's obsession to release polished games, made us feel it was very important to release a stable beta. Another reason we wanted a smooth beta was that our users weren't covered under an NDA. Players could finally talk about the game, post screenshots, and mercilessly criticize or enthusiastically praise our product. The decision to make the beta test NDA-free showed more pragmatism than confidence. We couldn't prevent players from leaking, so the company decided to just play it cool. After everything was tested internally, three thousand emails were sent to the first external testers to jump into the official public beta server. After the beta emails went out, several Sony developers working on EQ2 contacted us for beta accounts. Since we were at our maximum server capacity, we told them they'd have to wait until the next phase of testing was open.

After years of crunching, WoW was finally accessible to the public…and a minute after the emails were sent, the AT&T Hawthorn facility hosting our servers went down for reasons unrelated to our beta test (or at least that's the story they gave us), and all 3,000 testers encountered "server error" messages after they tried to download our game. The AT&T facility remained down *all day*. And the next. The day after that, they resolved the issue.

So at 6:00 p.m., Thursday, March 18, 2004, *World of Warcraft* went into public beta. Another email was sent, and an announcement on Blizzard's rarely used PA system sounded, "Attention: The WoW beta is live. I repeat: The WoW beta is live. The first transport is away!" The dev team was unprepared for the announcement, since we'd been waiting days for AT&T to fix their stupid facility issues, so it was met with almost no reaction. We were more impressed that we *had* a PA system. A few people looked out of their office doors to see if any team gatherings were happening, but nothing ensued, so everyone went back to work. A few of us even laughed at how little enthusiasm the team showed. Maybe we were just tired or getting used to launching alphas. The ennui might have come from the fact that only a handful of the team had worked to get the beta live or that we were launching with an older build of the game. Later at dinner, everyone gathered in the hall

to reminiscence about the old days of early development and discussed things such as our competition, the number of players, and how big the game would become. The topic came up again about whether anyone wanted to work on another MMO after WoW, and not a single one of us did. A few people perused the forums, but no one posted links to jubilant reviews. The producers threw a fancier-than-usual dinner for the team the next day, but it was pretty much an ordinary day.

Outside the Blizzard building, the response to the start of NDA-free beta was rabid. The battle.net message boards melted as our forums were overloaded by a stampede of users, and they stayed down for the entire night. Websites blossomed with testimonials from alpha testers unfettered by the NDA detailing everything they'd discovered. One website posted 3,200 screenshots. Someone rigged a real-time webcast of themselves playing, uploading screenshots every couple of seconds. Koreans were showing 33 percent concurrent users at 4:00 a.m. The servers briefly went down twice, but otherwise held steady for the first couple of days of the beta test. We hit our milestone of 1,000 concurrent players on March 20th, 2004, at 7:54 p.m., and our servers doggedly handled the load.



Capes, quivers, and pouches—artwork by Brandon Idol, March 2004 (shown in the NPC *paper doll maker*, a wowedit utility that allowed designers to mix and match visible armor components and "bake" them into a unique model). After much player and developer lobbying, it was decided that capes could be cheaply implemented if their animation followed existing animations for the tabard. Pouches could also be rendered cheaply because they all shared the same texture. Image provided courtesy of Blizzard Entertainment, Inc.

Aside from the public beta test, there were a number of other cool things that happened in March. On the art side, housecats were introduced into the game's civilized areas. You'd think after all the epic things we'd accomplished in our world, something trivial like housecats would be missed by our jaded dev team. The charm of pets in computer games simply cannot be underestimated. We all rushed to the latest daily build to see them walking around as our new favorite critter. Bags, capes, and quivers were now visible on the characters as well. Zone maps were in, almost by surprise. Maxx Marshall, a newly hired artist, and Carlo Arellano had been working on zone maps for weeks, although they weren't particularly enthusiastic about the task, as maps didn't particularly capitalize on their artistic talents. Concept artists often got stuck working on unchallenging, uncreative jobs, and accurate cartography restricted artistic freedom. Maps weren't the only thing the artists didn't enjoy doing. Before a prop could be made by a 3D artist, the producers wanted an approved concept sketch. It was a sensible approach, but it often required less than appealing tasks, such as doing sketches of brooms or rocks. Roman Kenney rolled his eyes and laughed after Bill asked for concept sketches of tree stumps. Concept artists are often unsung heroes because their sketches aren't in-game art assets, and credit often goes to the 3D modeler or texture artist. Maps were worse because there were so many of them, and they all looked the same. Carlo had designed character costumes for Stephen Spielberg and Tim Burton films (his armor was even featured in the opening credits of the 2001 *Planet of the Apes* reboot), but he and Max were professional enough to soldier through the weeks of aligning mountains and buildings to their proper positions. The team, at least, loved the results—especially the cities. The lack of city maps had long been a thorn in the side of testers, who had been getting lost in the cities for years, and showing players layouts dramatically improved navigation. The mini-game of unlocking all the map puzzle pieces was also a big hit with the team.

Another annoyance that finally ended was an interior-to-exterior lighting transition. Graphics engineer Tim Truesdale had abandoned the old lightmap system, which was similar to what first-person shooters use to generate shadows. Instead he adopted subdivided vertex lighting, which was what he created using exteriors, so his decision unified the game's lighting into one system. This also provided an easy fix for transitional lighting, and the dungeon team cheered themselves hoarse over the improvement.

Not to be outdone by the developers, the fans started improving the interface by taking advantage of the XML code that governed the UI. The WoW interface was highly customizable, and people were already making mods within a week of the public beta test's launch. Among them were apps to make UI windows transparent. Someone made a tic-tac-toe and Connect Four game. Another made a program that found shared quests of fellow party members, which saved everyone the trouble of asking and answering the inevitable question of what to do next. This was one of the first ideas we incorporated into our default UI. We also banned our first UI mod—a combat log script that spammed whispers to itself was choking our chat channel bandwidth.

Lighting transitions by Tim Truesdale, 2004. The new vertex lighting procedurally smoothed transitions into interiors, creating seamlessly blended shadows between interior and exterior geometry. Images provided courtesy of Blizzard Entertainment, Inc.

Fan-made features weren't the only recent development. Blizzard itself was growing. The GM department already had a dozen people on its staff, and it was strange to see a whole influx of unfamiliar faces walking around the building. Loren McQuaid and Dan Buckler were two newly hired programmers who respectively helped work on graphics and network code until the game launched. Three new designers were also now on board. Tom Chilton joined us from *Ultima Online* to design our fallow PvP zone, Alterac Valley, and to help with class balance. Jeff Kaplan had been busy with dungeons and so had no time for quests, so two more quest designers, Alex Afrasiabi and Shawn Carnes, joined to bring the quest design department up to five full-time people. Neither of them came from QA, so there was widespread disappointment amongst the support teams that development positions were going to external candidates. With the cost of WoW's development increasing, the hiring philosophy had gotten more conservative. QA recruits weren't always successful and there was so much at stake that Blizzard management began looking toward more experienced people to fill its roster. Nevertheless, we picked up our sixth quest designer, Suzi Brownell, from QA to replace someone who had left to work on a *Star Wars* game. As staff were promoted and hired, Team 2 grew from seventy to eighty people, including a dozen "borrowed" from Team 1. (When I'd first joined, the budget only allowed for forty developers!) Many of Team 1's designers and programmers helped retool our combat system, world events, and quests. Dozens of people from battle.net, IT, the server teams, QA, the sound team, and the localization team were on the Team 2 email list, and it was hard to tell whether someone worked on Team 1 or Team 2. Other departments were staffing up as well: The website team hired personnel to support

worldofwarcraft.com, our new website. Including the GM, HQ, QA, IT, and PR staff in Korea, there were now over two hundred people working on WoW, and we were guessing at launch there would be five to six hundred GMs.

People new to the project had a lot more energy and enthusiasm than most of the old-timers. Most of us loved the game but were definitely tired of it. We were sick of seeing one another, and we often made only half-hearted conversation over lunch and dinner. The rest of the team had finally joined me in vetoing pizza, and the producers spent more money to expand the variety of our evening fare.

We also hired launch managers to handle the tasks involved with simultaneous releases in multiple locations as more Asian nations insisted that WoW should be made available to them. Competitors like NCSoft, whose *Lineage* and *Lineage II* made $40 million a month, publicly claimed they would not allow WoW to compete. It remained to be seen if the gaming press in Korea could be influenced to "bury WoW" with negative press. All this drama seemed unbelievable to the dev team. To us, it sounded like typical marketing executives overvaluing the press's influence on fans. We believed that word-of-mouth reviews carried more weight, so we weren't really concerned.

The9 was Blizzard's Chinese game distributer, and their customer service department comprised two main rooms. The waiting room had forty seats for people wanting to talk to someone in person; when a customer's number was called, they went to another large room that looked like a bank with counters and glass dividers between staff and customer. Needless

to say, this was a peculiarity of the Asian market and we had no plans for doing it anywhere else. Image provided courtesy of Blizzard Entertainment, Inc.

April 2004: Curious Tidings from Abroad

The producers went on a week-long meeting in Palm Springs with the GM and tech staff leads to discuss localization with launch reps from around the world (or at least that was the story they gave us). They reviewed logistics with Blizzard's partners from European and Asian markets and the various issues of rolling out WoW worldwide. The game would have over a million words to translate, and it was already difficult enough to have a simultaneous launch in Korea and the United States. Everyone was insistent on having not only the WoW beta in *their* market, but also a localized launch of the final product. Blizzard wasn't keen on ruffling anyone's feathers, but our resources were stretched thin, so we refused to promise anything that would delay our launch in Korea and the United States. The representatives from China were by far the most organized, with charts, schedules, and specifics about supporting our game; they had the most experience of launching big titles and were geared up for a projected two million players. Spanish and Italian reps were dismayed to find out that Blizzard could only support localization for French and German in our European servers. Even Japanese Vivendi reps were present at the Palm Springs gathering, and they proposed the unheard-of possibility of translating an American subscription-based computer game into Japanese, which had never been done because Japanese gamers were almost exclusively console-based and highly resistant to Western titles. Even though the producers expected a heavy load of coordination tasks, it was eye-opening to see how much product support was involved in offering WoW to world markets, each with its own set of logistical and operational issues.

If one studied international press releases about our game, one might conclude enthusiasm for our WoW wasn't universal. We circulated an internal report about how the Korean media reacted to the WoW beta test. Their business, sports, and mainstream press (none of which had actually played the game) were very biased against American companies, and we knew they might be manipulated by our competition, so we weren't surprised they read like tabloids. *Sports Chosun*, one of South Korea's daily sports and entertainment newspapers, reported on March 30, 2004, "*World of Warcraft* is worse than expected. Korean MMO companies are rather relieved after ten days of closed beta of *World of Warcraft*. Most fans who tried out WoW say 'It's too difficult to play,' and 'everything in the game is worse than Korean games.' Only a few MMO buffs are praising it as revolutionary. MMO experts predict WoW would have '10,000 concurrent players at most.'" *Kyung-hyang Games*, a weekly gaming newspaper, reported, "WoW is generally disappointing as it's too difficult to play as the keyboard interface is too alien to current Korean MMO players. Industry analysts forecast that the peak

concurrency of WoW won't exceed 20,000 players. Beta testers are also complaining about the quality of the game."

We weren't disappointed by these reviews, however, as we knew these articles were PR pieces created to harm *World of Warcraft*'s reputation. There were other, more favorable mainstream reports, many sources acknowledged WoW's potential, and, more importantly, players knew the hit pieces weren't true. The lack of an NDA allowed fan sites and beta players to speak out against the press as Korean feedback buzzed with screenshots, reviews, guides, maps, comics, and TV-style coverage. After countless reviews, it seemed the only legitimate critiques of our game were comments on the unattractive Horde females.

But NCSoft was definitely playing for keeps. One of Blizzard's press functions for the Korean financial press was trumped by NCSoft's sudden disclosure of their quarterly financial results, which were scheduled to be announced at the same time of day. Part of the press announcement was NCSoft's budget for an "anti-Blizzard warchest," which would protect their market in Korea by getting the media to trash Blizzard in the press, while also making offers to hire key people away from the development team, and sabotaging WoW's servers or customer support. This coming from an NCSoft press conference was strange to us—in that they were openly admitting to a strategy that was based on low confidence in their own product. It implied that they couldn't compete on a level playing field. At the time, it was an amusing announcement to us, but less so when they hired away seventeen key members from our dev team one year later.

A brief team meeting was held regarding our shipping date. September 15 was the gold master candidate. "Going gold" was an industry term Apple coined, referring to a software build that passed all tests for mass production. This gave us five months to finish WoW. No new systems or features were going into the game, and no systems were being rewritten. The game was shipping no matter what. Even if PvP wasn't fully implemented, we were shipping. If WoW didn't ship, Blizzard's relationship with its parent company would be sorely tested because it would be the first year that Blizzard wasn't profitable. One reason it was such an expensive year was because we purchased, not rented, the incredibly expensive servers needed to host the game. It was one of the biggest single purchases (if not the biggest) of server hardware in the world, and because we couldn't get money out of our parent company, we purchased the machines with capital secured through bank loans. In North America alone, we were planning for more than sixty realms, and each realm required eight server blades. In total, these machines would support half a million players.

Blizzard staff on tour in Asia stopped by NCSoft's Korean headquarters. Pictured is the customer service center where players could talk (i.e., complain) in person. Our interpreter talked to a very cautious security guard, whom reluctantly gave permission to take this picture (although doing so made everyone in the room look nervous for some reason). After the Blizzard staff left the building, the interpreter giggled and confided that she didn't tell the NCSoft guards that we were from Blizzard. Image provided courtesy of Blizzard Entertainment, Inc.

Korean server room, April 2004. A mostly empty space that would be filled with Korean servers by the summer. The Chinese server room was five times bigger. Note the air-conditioning vents in the floor to keep the servers cool. Image provided courtesy of Blizzard Entertainment, Inc.

May 2004:
The Care Bear Game

In addition to designing the class mechanics, Rob Pardo can take much of the credit for making WoW accessible to casual users. He came up with an elegant corpse-retrieval system that ameliorated the post-death anguish previous MMOs embraced. He made leveling much faster and implemented a "rest system" that rubber-banded the rate at which hardcore and causal players leveled. Instead of punishing players who played the game non-stop, Rob rewarded casual players for taking sensible breaks. As per usual, the fans on the forums went berserk about Blizzard turning WoW into a "Care Bear game" and that we were forcing customers to limit their time, but after a week the hysteria blew over. The public reaction was annoying, but Rob and the designers held their ground: The rest-state bonus remained after tweaking only a couple of its values.

Also changing in WoW was the inclusion of a bazaar system (which eventually became the auction house). It was another controversial issue because the game designers preferred a more person-to-person exchange of goods—a social preference that looked impossible to maintain if players could just transfer items anonymously offline through a marketplace plug-in (using WoW's own flexible UI code). The bazaar plug-in's own popularity was what tipped the scales in favor of establishing an auction house. While not surprised by this end-user innovation, it was disconcerting we were changing the game because we couldn't prevent players from implementing their own system.

I was getting more company in the office during my weekends as all the designers were coming in on Saturdays, mostly to finish the higher-level content. The new talent system wasn't fleshed out yet, but with only five months left, the game designers were working hard to make talents more robust. I was still cranking away on dungeons and micro-dungeons. The low- and high-level dungeons were getting built and textured well ahead of the dungeon scripters, although construction on a couple of our mid-level dungeons was lagging behind (Maraudon, Dire Maul). This delay greatly weakened our ability to learn how players looked for groups, valued boss loot, and behaved in dungeon crawls. Pushing midlevel dungeons to a later patch created content holes. And even if beta testers leveled past them, they couldn't run though endgame dungeons because high-level abilities didn't exist yet—so few dungeons were getting good feedback. By the time the mid-level dungeons of Maraudon and Dire Maul were released, they were too low-level for much of the audience.

E3 mural diagram, May 2004. Screenshots were Photoshopped together into murals. Hacking together screenshots was as far as the team cared to commit for the promotional event. Making E3murals interesting was the least of our concerns. Image provided courtesy of Blizzard Entertainment, Inc.

Shifting into Low Gear

Blizzard never forced people to stay late, although peer pressure, deadlines, heavy workloads, and self-motivation contributed to people committing themselves to years of long work hours. If people went home "early" at 6:30 p.m. the company let them. Producers usually requested employees work late twice a week, but no one was ever let go or reprimanded if they had personal priorities. However, employee voluntarism had waned over the past few months as discontent rippled across the team. Because many of the designers were new to the project, they hit the ground running and couldn't understand why the artists (who had been there longer) weren't embracing the crunch-mode hours. When dinner arrived, some of the artists would make an appearance at the meal table and leave afterwards. Producers didn't want half the team working while half the team went home, but there wasn't much that they could do about it, so team unity gradually withered.

The nature of development worked against the artists. Programmers and designers spent their time entering code and data, making decisions in meetings, and fixing bugs—they immediately saw the results of their effort. This was more motivating than the art pipeline, which involved clearing off an indefinite list of art requests that they might see in the game sometime in the future, if ever. Because artists didn't have the same immediate gratification or closure that designers and programmers enjoyed, they never felt a lift as the team approached the homestretch. Also, few artists played MMOs, and they were sick of the never-ending project. Many who weren't in the same situation were tired of their complaining, goofing off, and absenteeism.

Money was another gripe. Before WoW shipped, Blizzard's compensation was only competitive after the bonuses, which had diminished since the company began working on this MMO. Coupled with the fact that Blizzard was in Irvine, California, surrounded by houses that cost triple the

national median, very few employees who'd moved to Orange County could afford even a tiny condominium. I had moved from NYC and was used to renting, so I couldn't care less about owning a house. But I wasn't blind to my frustrated teammates who wanted to start families of their own.

The morale was affected by our team getting bigger; our very size pushed us apart socially. Gone were the times when everyone in the office knew one another, and now departments kept to themselves at lunchtime. It also became more expensive to upgrade anything for a team of our size, so smaller teams had better equipment, software, and furniture; it fostered a petty perception that Team 2 was being neglected.

Updates to new tools or requests for tool optimizations were also a touchy subject because our tool programmer was too busy on a more pressing matter. David Ray was almost exclusively devoted to creating a secure GM tool for our customer service—something the devs didn't care about—so most tool requests for wowedit were denied. David's "god tool," as it was called, became renowned for being the most robust in the customer support industry—partly because most companies didn't devote enough programmer time to their GM tools. But having a solid GM tool meant the dev team had lost our only full-time tools programmer, and it meant many wowedit tasks were often awkward, repetitive, or time consuming. The producers got all the blame for these sources of friction.

While blaming producers is standard operating procedure throughout the industry, this effect had driven a wedge between the employees and middle management. Many efforts were made by the producers to respond to complaints, but these attempts only backfired and fanned the flames of discontent into wider circles. The trust that had kept the staff together for years had become fractured by the end of the project. And it wore on everyone's nerves, especially since some people were working longer hours than others.

Aside from a few of us, the majority of the team simply wasn't in crunch mode anymore. Absenteeism and lack of self-discipline plagued the staff, and many of these issues had been festering over the years. Some employees openly rejected the producers' requests to work longer hours on the basis that this MMO would never be finished—and there was much truth in that belief. We were postponing features until after our release day, and we knew about needed expansions, new continents, live-content updates, and patches. There was so much work ahead of us, it seemed as if shipping the game wouldn't provide the team with any closure. Many expected that the pressure to create content would become *greater*, not less so, after the game shipped.

Still, it was not all gloom and doom. It looked as though September 2004 was a feasible release date for the game. More important was that most of the team believed this was a reasonable date and not an executive, ivory-tower estimate. The same couldn't be said a year ago when most of us (myself included) thought WoW was going to be a 2005 release.

Mark Kern had to repeat to the team that we weren't cutting PvP, just postponing it. He emphasized WoW was a live game, so missing features or bugs weren't the end of the world. This explained why Alterac Valley wouldn't be included in the shipping game. James Chadwick had finished the giant PvP zone, although with little enthusiasm. He expressed his concern to me once: "I don't know why the designers want the PvP zone to be so big, especially since it's going to be an instance." It was so large we couldn't test it internally (a full test required eighty players) because it would interrupt the schedules of many busy employees, so it was kept on the back burner. One feature that *was* making it into the shipping game was the expanded talent system that Tom Chilton and Kevin Jordan were working on non-stop. The robust talent system would be one of the last features to make it into the shipping game.

At the end of May, WoW's US servers hit a milestone of two thousand concurrent players (this was important because it was our target capacity for a realm), and beta testers *weren't* getting tired of playing despite the unfinished talent system, lack of high-level content, unfinished zones, empty dungeons, and missing quests. The drive for randomly acquired items and socializing kept testers happy and occupied.

E3 2004

"Didn't we just fucking go to E3?"

— Chris Metzen, providing the team meeting (wherein E3 preparations were discussed) with a moment of levity

Blizzard didn't get much out of going to the Electronic Entertainment Expo. One could argue the most beneficial aspect of the show was having promotional statues, props, and signs to decorate our offices. The arrival of the 2004 E3 was a surprise to much of the team; many devs didn't even realize it until we saw press previews online. Previously we prepared months in advance for E3. This year the game was already polished, and very few people on the development team were involved in the booth preparation. Our demo was simply a stable build of the beta, so the only people who crunched were our cinematics department. A day before the expo, the weary cinematics staff presented the WoW trailer that introduced the Warcraft races and classes. We knew it would be a hit at the show, looping on our giant screen above the Blizzard booth.

Since the producers didn't want anyone on the team distracted from crunch-mode tasks, the people running the booth's WoW stations were GM staffers and no one on the team recognized their faces. Seeing our game being presented by other departments was another hint that this game was no longer ours. Unlike in previous years, very few of the developers hung out in our booth. Instead, WoW devs checked out what the rest of the industry was doing.

Because there weren't NDAs in our beta test, the public already knew everything there was to know about our game, so there wasn't anything new to tell the press except the game's shipping date, which we described as, "late 2004." The comments and enthusiasm for WoW were mild compared to previous years, and since we were no longer the "new thing," the game journalists had moved on, and that was fine with us.

Magazine advertisement mock-up, May 2004. Bill Petras and Justin Thavirat joked about being the “WoW marketing department,” and as the project got closer to the shipping date, they continued to focus on the out-of-game promotional artwork.

Note the misspellings of Orgrimmar in the dummy copy. Without webpages (internal webpages never stayed up to date), the team mispronounced and misspelled half of the names in our lore. No one really knew for sure (or cared enough to check), so we all just phonetically spelled our file names. Karazhan was particularly prone to spelling deviations, which sometimes made searching for its art assets tricky. Image provided courtesy of Blizzard Entertainment, Inc.

June 2004:
Public Beta 2.0

Death effects, Tim Truesdale and Brandon Idol, June 2004. After seeing the *Lord of the Rings* movies, the staff decided it was too cool not to feature-creep new video settings to emphasize a character's death state. Image provided courtesy of Blizzard Entertainment, Inc.

There were three months left until our September deadline, and already there were aspects of the game ready to ship. Animation was mostly done. The exterior zones were done—the Emerald Dream was the only zone still being developed, and it was becoming doubtful we would include it. Chris Metzen described it as our wildest zone, with crazy trees and dream structures, but so far the artists weren't happy with the results. It was so high concept, it looked a bit silly in-game. Jeff Kaplan, who had moved away from quests to endgame design, reassured the art team that new zones weren't needed. "There are only so many upgrades we can give to armor sets," he explained. "It's great we have too much content already because that will encourage people to play more than one character, but we really don't need more zones."

Trade skills were looking great and even programming was in good shape. The areas we absolutely needed to finish were the class abilities, talents, and dungeons. Quests would also be thin at the higher levels, but they were not so mission-critical as getting dungeons built, textured, spawned,

quested, and balanced. A number of 3D artists had moved to the dungeon team to help create props and textures.

There were only 3,600 recorded bugs left to correct, and they were evenly split between the programmers, designers, and artists. As the higher-level abilities were finished, the endgame zones became playable, and so the bug reports increased. The producers used bug totals to measure the game's readiness, and it was a constant battle to keep active bugs down.

All bug reports were organized by an internal HTML-based program called Inspector. In it the QA department entered the relevant information needed to identify each error; it included screenshots or videos with descriptions of what was wrong. A structure of managers, testers, and producers forwarded the reports to the developers, who were capable of solving each problem. Everyone went through their own bug list, fixed them, and entered the changes in Inspector so that the QA department could verify the corrections were made. Toward the end of the project, there were so many new faces from QA that were integral to the game's progress that it became difficult to count the number of people working on the project. Having finished the *Warcraft III* expansion, a score of Team 1 developers were helping out with programming and design, which brought the headcount of everyone developing the game to the high eighties. A few months later, they returned to their own project (preliminary work for *Starcraft II*), thereby reducing our devs back down to sixty-five.

Beta 2.0 PvP server, June 2004. The PvP server went live with the Alliance characters

outnumbering the Horde, two to one. The chief obstacle for undead players was getting to new zones without Alliance players ganking them before they could bind themselves to a new location. Kevin Jordan (who gave each race its own racial perk) joked that the racial bonus for humans was being surrounded by allies all the time.

By the time the Alliance players fought their way through Hillsbrad and Silverpine, the call to arms was out among Horde players, who rallied to receive the invasion with twice as many players (but at half their level). The two sides seesawed between Tarren Mill and Southshore. *World of Warcraft* was finally playing like a war! Image provided courtesy of Blizzard Entertainment, Inc.

The push for the second phase of the beta was relatively smooth. It took a week to iron out the major bugs, but this was the first time the developers' workflow wasn't being interrupted by a testing push. This was partly because of version-control tools that allowed developers to work locally on their own computers without introducing bugs into the beta build. Incredibly, this was the first time we'd used version control software, and it made for safer patches and updates thereafter.

The programmers and producers crunched the late hours necessary to get the new beta out. Since the original beta was a month-old build, the 2.0 version was a much-needed boost in content and features, notably the addition of a player-vs-player server that helped the team evaluate combat dynamics. We still weren't close to implementing the complex PvP battlefield of Alterac Valley, and no one cared because the open-ended PvP free-for-all was fun enough. Rob Pardo's rest system wasn't a controversy anymore, and the level cap had been raised to forty-five; mounts and mail were added, and Orgrimmar and Ironforge had new layouts with shortcuts that reduced travel times.

Our new hire from Microsoft, Loren McQuade, had finished a major optimization of the animation for handling large groups of players. His improvement didn't make the beta, but the high congestion in PvP battles showed us that Loren's code would help frame rate dramatically for some video cards.

The old talent system was disabled in preparation for the new one. Tom Chilton, our recently hired senior designer, had been crazy-busy with talents. A talent skill-tree wasn't part of our plan, but having another designer on the team enabled us to make a much more robust secondary skillset that allowed players to distinguish themselves from others in their class. It was ambitious to embark on a talent system with only a couple of months left in the development cycle, but we made it a top-priority issue.

The evolutionary ascent of the talent system, November 2002–June 2004. Talents originally came about because a player didn't feel immediately better after leveling up. The problem was players wouldn't get anything new until they talked to their trainer, and that meant delays in "feeling improved." Allen Adham thought it would be a fun perk to let players pick a stat they wanted to increase. So talents started out as tweaking tiny, red attribute buttons next to the core stats. This method felt good for a while, but it became apparent there were long-term problems. All the melee classes picked the same stats, no one wanted spirit, and this customization didn't afford players with new ways of playing. It was largely a transparent reward, especially at higher levels.

A more robust talent system addressed the issue of all players choosing the same talents. Players could specialize in weapons, schools of magic, or combat maneuvers, or against types of foes (including the nearly useless “bonus against dragons”). This felt better, but classes still poured their points into the same attributes (mages into intelligence, warriors into strength), and even if they chose something weird or different, gameplay experience was exactly the same. Images provided courtesy of Blizzard Entertainment, Inc.

The “final” version showed the new user interface functionality of a skill tree that was customized for every class. Not only did it require engineering to create skill trees, but there were many new abilities for each of the nine classes—it was about a hundred times more work than the original talent system, but the skill tree made the player’s game experience different from others in the same class. It took a month for Tom Chilton, our newest game designer, to implement the first two classes (working ridiculous hours), so it was a major challenge to create and balance all the other classes with only three months left until the gold master candidate was due. Welcome to Blizzard, Tom!

July 2004: Public Beta 3.0

Repeated failure to push even modest updates to the test servers on anything resembling a schedule was eroding the team's confidence in its ability to deliver anything on time. After rescheduling a dozen times for each of the alpha pushes, the producers had all but given up emailing the company (who eagerly wanted to play) about when to expect the next update. After two horribly delayed betas, the third public beta test was supposed to be easier, with few major changes (data tweaks, balance changes—no features), yet the team was met with weeks of technical hitches. Blizzard's upper management met to determine the launch schedule. It was the first such meeting to actually set things in motion and plan for upcoming dates. As of July 22, the final schedule was:

August 15—stress test (in North America) with 100,000 players
September 15—feature lockdown
September 22—second stress test (in South Korea) with 100,000 players
October 15—content lockdown and gold master candidate
November 1—open beta
November 15—game on shelves

The producers explained *World of Warcraft* would be broken down into four CDs. The first one was the sole responsibility of the cinematics department, while another was devoted to sound and musical tracks. For the next few months Team 2 would focus on the last two CDs, containing the art, data, and code of the game. The developers were warned that when art was "locked down" the third and fourth CDs would begin their manufacturing cycle (but everyone would continue to work on various upcoming patches). It would become a strange, new rhythm, where people would be working in different stages of development; some would be working only on bugs, while others worked on art and features for patches scheduled further down the road. And there was never going to be a point when anyone was ever *done* making the game.

Shifting into High Gear

Despite the ominous realization that the game may never be done (many people were ready to move on to a new project), the prospect of shipping a Blizzard game stoked the spirits of even the most burned-out devs. People smelled "finish" in the air and were once again staying late without being asked. Concrete dates convinced people to redouble their commitment to

crazy hours again, and even the more ornery members of the team were now crunching until midnight every night. Others tested the balance of our game and told their families to prepare for their long absences, including weekends. Producers, artists, and senior programmers were around until the early hours of the morning to make sure everything went well. The mission-critical issues were dungeon play-throughs to test the balance of monsters, loot, and scripted encounters.

Regardless of the dramatically improved morale, productivity was rocky and plagued by downed networks, broken builds, and database mix-ups. As a result, testing the game—especially dungeons—was frustrating and slow. The dungeon scripters were also working on the largest, most complicated dungeon so far: Blackrock Depths. They had been scripting, spawning, and testing it for almost six weeks, mostly because of the technical delays and broken builds. Week-long delays between working builds made conditions for dungeon scripting and questing challenging, with four big dungeons left to do in just two months. There were going to be two raid dungeons at launch that we didn't even know how to test yet because we needed forty people who knew the game well enough to simulate a practiced guild. There were other raid dungeons—Stratholme, Blackwing's Lair, Karazhan, and the Black Temple—that were going to be pushed back until after the game shipped.

Jason Hutchins (who had been our first QA tester three years earlier) was now a producer and was in charge of localization. He estimated that each language translation took about three months for six or so people working full-time. We planned to ship WoW in six languages using a localization and production team based in Ireland. The same company manufactured and boxed Blizzard games, and Jason also oversaw the game's manufacturing. Our localization was outsourced and subcontracted to other companies, so there had already been scores of people translating WoW for months. This included spoken sounds as well as text. A lot of work was saved by procedurally translating words, so whenever the game mentioned common words such as "damage" or "ogre," it was automatically translated. Translation had started long before the game was finished, and each language was in different stages of completion. Whenever text was changed, it automatically got flagged so the translators would be notified of the new version.

Jeff Kaplan and Shane Dabiri met with several European journalists to answer questions. The discussion went well, and the buzz from the European press was encouraging. The demand for WoW in Europe was much more than we had originally thought, (as far as we knew, Europeans played mostly racing games). Previous Blizzard titles hadn't done especially well there (sales barely made more than the cost of translation), so we didn't consider them to be an important market. We were shocked to learn that European beta signups tallied almost as much as the US.

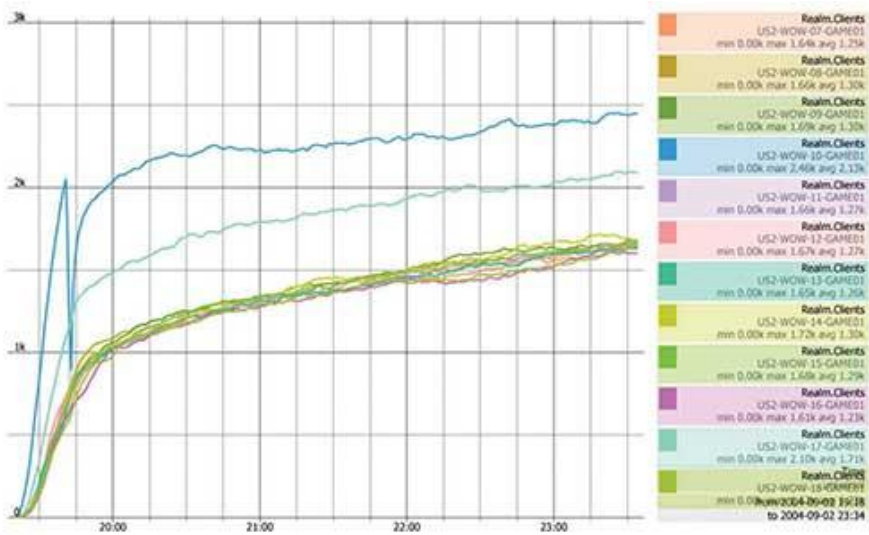
We were also puzzled by the high churn rate in Korea (25 percent). *Churn*

was the measure of how many people were quitting the game. North American churn was amazingly low, at only 5 percent. The producers had expected a lower churn in Korea and sent inquiries to those quitting as to why they dropped out of the game. After looking at two years of Korean gaming magazines, it was apparent the Koreans didn't enjoy playing the "monster races" of the Horde. In Korea, monsters were to be killed, not played, so it was beginning to look like the Korean servers might not be as full as we had anticipated. A not-so-surprising statistic was that three out of four Koreans preferred the PvP servers to non-PvP servers (while the American player base was evenly split). We hoped our PvP battlefields would help boost Korea's level of interest. Another issue holding WoW back was that the game didn't allow for *Diablo*-style point-and-click movement, which was important because it freed up the player's hand to hold a cigarette. In the end, WoW demanded too much attention for the casual atmosphere of Korean Internet cafés, and we planned to address this problem with the interface. Mark Kern summed up the company's desire to address the concerns of the lucrative Korean market: "If Koreans want point-and-click movement, we'll give them point-and-click movement."

Another surprise was that gifts from beta players arrived in the mail. Pizzas, cookies, Krispy Kreme donuts, and candy baskets were being sent by beta testers to show their appreciation for the development team's efforts. Despite the fact that Blizzard had many more beta testers for *StarCraft*, *Diablo II*, and *Warcraft III*, this had never happened before.

Blizzard attended the 2004 Leipzig Game Show and reports described our booth as being like a zoo. It was the busiest booth, crammed with enthusiastic press and consumers. We were surprised once again by the level of interest expressed by the European market, which hadn't been a significant part of our audience despite the effort we put into translating our titles. Images provided courtesy of Blizzard Entertainment, Inc.

August 2004: Public Beta 4.0



Server populations, September 2, 2004. The first few hours of the stress test has seen only one crash. Blizzard invited newspaper journalists to document the day and warned them that everything could fall apart, but providence blessed us with fair winds and smooth sailing. Image provided courtesy of Blizzard Entertainment, Inc.

We finished an especially brutal beta test push called Beta 4.0 in August. So far, not a single "push" for the beta had gone out on schedule. Weary programmers and designers staggered around the offices past midnight every night to get a stable build sent to the beta servers. After the 4.0 push went out, everyone stayed home on Saturday and Sunday. We were planning two pushes a month to update the servers, but we were already three weeks behind schedule. The company itself underwent an internal network upgrade and even *that* didn't go smoothly, so entire days were lost as people couldn't work. A database change that allowed quest designers more control over manipulating the world's doodads caused almost ten days of crashing, and it prevented designers from testing any of their endeavors. The routine had become mind numbing. We laughed at our own lunchtime conversations, as the only thing we ever talked about was WoW. There was nothing else going on in anyone's lives.

There were other core systems that were still unfinished, such as the high-level character abilities, items, quests, and talents. But unlike the dungeons, these could be added to our data-only post-launch patch. The quest designers had pushed through Blackrock Spire and Stratholme, and everyone on the

exterior design team was working on the Plaguelands and Silithus, the last two unfinished exterior zones in the game.

A couple of coworkers and I went to see the movie *Collateral* one evening. When we came back to the office around 11:00 (to go back to work), we ran into Chris Metzen sitting in the hallway. Upper management was making an effort to stay late with the team to show solidarity, and tonight was Chris's night. He was playing the new beta and preparing for the final boss fight in Gnomeregan. Dungeon crawls were far more intense than anything he was used to, and he told the people standing behind his desk that he actually felt nervous before the fight. "Dude, my heart is pumping so hard right now, I'm gonna have a fucking heart attack. Just look at my hands, they're shaking. I've never been so nervous about a game before this!" As his party prepared to fight the Gnomeregan end boss monster, Mekgineer Thermaplugg, Chris typed, "Remember guys, he's just a gnome!" After a heated battle, Chris died screaming, seconds before the boss collapsed. This was before players received postmortem credit for kills, so Chris couldn't complete his dungeon quest. He was so disappointed, he immediately went home. When I told Jeff what had happened the next morning, he laughed and replied, "Ouch. That really sucks. We should give kill-credit to everyone in the party, dead or alive."

In an effort to show people that there was a light at the end of the tunnel, producers sent emails showing that task and bug lists were being reduced. They broadcasted progress to the team on a daily basis to keep everyone cognizant of the approaching deadline. The artists, designers, and programmers were more interested in adding new things to the game, but Shane Dabiri's team-wide email captured the enthusiasm that only producers have for knocking off bugs:

> "We're 35 days from gold master and we're moving along at a fair clip. I just wanted to commend everyone for their outstanding performance on getting tasks and bugs knocked off. Here are some good stats for all of you.
>
> 622 bugs have been removed from our Active Bugs in the past 8 days!
>
> 118 tasks have been implemented from our Active Tasks in the past 8 days!
>
> We are knocking off on average 92 tasks/bugs per day! With 35 days remaining and 3,019 active bugs/tasks, we will complete them all if we keep up this rate!"

The new combat system in the Public Beta Test 4.0 push recognized weapon skills and had a new loot system that truly reflected the monster level. The item stats had bigger numbers, so players perceived them to be more powerful even though they were not. Trolls were the final player race to get

into the game, and zeppelins and ships were working for the first time. There were now four classes with talents and the level cap had been raised to fifty-five. Blackrock Depths and Stratholme were open for business, as well as a dozen new micro-dungeons.

The beta also saw lots of class balance changes. Fan reactions to them had been largely negative, as usual. Kevin Jordan (who made all the player abilities) joked that he was going to tell fans at our launch party signing station that he was an artist to avoid class-balance conversations. Players with overpowered skills and items grew to love them and vented whenever they were "nerfed." Mages were recently affected by a power reduction, notably limiting their invisibility. But despite the omnipresent complaints, players still loved the game, and the servers enjoyed a steady cap of 2,000 concurrent players.

September 2004: Going Gold

Orc demolisher by Brandon Idol, August 2004. Vehicle models were being made for the impending implementation of PvP. We didn't know where they would fit into the scheme of things, but we all knew we wanted vehicles. Image provided courtesy of Blizzard Entertainment, Inc.

On September 2 at 12:15 p.m. PST, *World of Warcraft* launched its first official stress test. Approximately 140,000 authentication keys had been delivered over the previous seven days by GameSpy's FilePlanet. Within the first few hours, approximately 44,000 accounts were created, and we were hovering at around 23,000 people across a dozen realms. So far our account creation process had been very smooth, and we hadn't had any performance issues within the game. Blizzard announced a contest to see who could level the fastest to look at both class balance and exploits, and after ten days of playing, someone managed to make a fifty-second-level character, which gave the designers something to puzzle over: how it was achieved. The stress test provided enough assurance our launch would be a smooth one, and it seemed we had cleared the last major hurdle. With all our preparation, there was just no way our servers would crash on launch day. No way at all, right? *Right?*

Other projects came together. A few people in the cinematics department had put together a DVD about the making of WoW, featuring some of the developers doing voiceover explanations of what inspired them and how things evolved. A desktop publishing freelancer was brought in to compile information for the manual. He only had a week to complete the document, so he worked around the clock with a couple of developers in order to make the deadline. Meanwhile, Bill Petras and I pulled an all-nighter retouching maps for the *WoW Bradygames Guide*. I was happy to utilize my long-neglected photo retouching skills from my advertising days, and my dungeons were on lockdown to prevent me from introducing any bugs into the build. It felt weird doing nothing when all the designers and programmers were still crunching. The project was nearing an end.

The crunch continued as half the team worked until midnight every night. The final month saw a lot of raid content implemented and tested as Scholomance, Onyxia's Lair, and Molten Core raids went in. PvP battlefields were still largely untested, so their fate hung in limbo, but the PvP armor was getting added to a ranking system. Eric Dodds, John Yoo, and the quest designers changed the stats on every item (again), rebalanced class abilities, implemented high-end trade skills, and finished talents.

There were over 3,200 unique sounds in WoW, not including the music MP3 files. These sound files were unlikely to change, and so they went into the first of four CDs. It went gold on September 16, a month before the final disc would leave our office to be mass produced. Because the initial disk was dedicated to sounds and music, "going gold" wasn't met with any relief, closure, or ceremony—it was another team's accomplishment. Team 2 continued its work until the feature and art lockdown went into effect on the fourth CD. After the last disk left the office, the designers and programmers spent one more month making data changes and bug fixes for our first live data patch.

The Battle of the Storms

Unbelievably, the day after our first CD went gold, a tornado initiated by Hurricane Ivan ripped open the data center in Virginia, taking down Blizzard's East Coast servers. Both WoW and *Star Wars Galaxies* went down, and there were reports that the *EverQuest II* log-in server was found in a parking lot! But the WoW servers fared much better, despite the water pouring in on top of them. Luckily, they were turned off in time, so the water damage was minimal. As it had taken months to order and install these rigs, a serious hardware loss would have reduced WoW to supporting only the West Coast. Between pending insurance litigation, securing new funds for new servers, and waiting for new servers to be manufactured and installed, the East Coast WoW servers had dodged a tornado-sized disaster by a matter of meters.

The East Coast data facility, post-tornado, September 18, 2004. Luckily Blizzard's servers didn't bear the brunt of the damage, but it took days of blow-drying the hardware before the equipment was safe enough to turn on. Images provided courtesy of Blizzard Entertainment, Inc.

A still of security cam footage, September 2004. A facility technician heroically shuts down a "450-volt power inverter" (triple the voltage of a hairdryer) while standing in a room-wide, quarter-inch-deep puddle. The Blizzard techs were in awe of his daring, as water dribbled, from a beam above, onto the very units he was powering down. In the video, water could be seen running down the side of the cabinet. Note the reflection on the wet tiles (by the air

conditioning vent in the floor).

October 2004: World's End

After the art lockdown went into effect, a full week was spent fixing the final art bugs as assets were prepared for the last gold master CD. The CD would be flown to Europe for mass production, and would take one month to manufacture, package, and distribute. During this month, the game designers and programmers would continue to fix bugs for the first patch. There were fewer than three hundred bugs in the game (fewer than *Warcraft III* when it went gold), and most of them would be fixed in the first code-only patch. The artists spent time making outfits and weapons that were more Horde-specific, as it was realized a little too late in the project that more of the quests and outfits and buildings were designed around playing the "good guys," which left the Horde content disproportionately thin. The artists' imaginations were naturally inclined to think in human terms, and our outfits reflected this. Ironically, most of the developers had played Horde characters in the beta, so we realized firsthand how neglected Horde races were, as we too, became jealous of the spoiled Alliance players!

Congratulations were half-hearted as Team 2 applauded itself at our wrap-up meeting. The development team was weary from four years of late nights (working late twice a week) and the past few months of solid crunching (working late every day of the week). The team was older, as was the industry. We had avoided working the prolonged nine-month crunches the *StarCraft* team had sustained, partly because of our late-nights slow-burn strategy and partly because of family duties. Our lack of jubilation wasn't only from the exhaustion of our five-and-a-half-year project, but also from being cognizant of the workload ahead. The wish list was long, namely PvP, player housing, expansion zones, and new dungeons, including two missing mid-level dungeons. There were several dungeons that weren't going into the final shipping product, mostly because it had taken longer than expected to build, script, spawn, quest, and test. Four would be added to our second patch, which was a big art update. We already knew players would level up fast, so the need to finish our mid-level dungeon content was immediate.

There was also talk of post-shipping priorities—of tools everyone wanted that would allow devs to create content faster, and with more precision and flexibility. People talked about vacations, time off, and wrap parties, but none of it was very serious. There was a fear that the late nights would go on for a long while as players demanded new things to explore and do. The attitude toward the future was guarded optimism.

There were two design milestones reached after the gold master discs left for mass production. The first was a twenty-vs-twenty player test of a forty-vs-forty PvP zone. Developers were assigned a fortieth-level character, divided into two groups, and let loose on one another in Alterac Valley. Half of the testers were artists (who weren't busy on critical data-patch fixes), and they weren't familiar with even mid-level spells, while the other half were designers whose deadly skills were among the sharpest in the company. The designers repeatedly stomped on the artists with dispassionate, apex predator efficiency. The PvP zone mobs and guards were largely ignored because players had only a vague idea that killing the other side's captain was the way to win the match. The teams scattered in every direction across the unfamiliar terrain without any idea of what to expect, what to do, or where to go…they were the perfect play-testers. Nevertheless, participants who found enemies had some fun and almost everyone played for an hour without any goals other than to find weaker opponents to crush. Some testers never found enemies and logged off; others settled into battling one another without paying attention to the goals. When a player died, they reappeared in unfamiliar graveyards and were immediately lost. Because of broken UI functionality and the fact that the mini-map didn't yet show ally locations, players who respawned often ran in the wrong direction. No one paid any attention to the mobs or guards. With only twenty players on each side and inoperable or unfinished technology, the first play-test was a laughable (albeit enjoyable) mess.

The first raid in WoW, October 15, 2004. A twenty-person test was held to see if aggro-

management worked in large-scale groups. Premade characters were assigned to the volunteers, who practiced Onyxia (scripted by Geoff Goodman) and several Molten Core monsters (scripted by Scott Mercer) to see if monster attacks and abilities worked and felt fun to play against. Like all initial test runs, most of the battles were unbalanced and abilities were broken, but the one-hour session produced useful aggregate damage data. After newly rewritten aggro code had been implemented, the full forty-person raid was supposed to show whether the raid dungeons were balanced. It was hard getting forty people to play-test something as a group, but it was the only way to balance combat. Image provided courtesy of Blizzard Entertainment, Inc.

The second design milestone was our first test of raid content. A few weeks before the game went gold, Jeff Kaplan came into my office after the art lockdown was in place and asked me in a whisper how fast I could build a big raid dungeon. By then I knew if Jeff was talking in a hushed tone, he was trying to ninja something cool into the build (something I was always eager to help with). "We need something fast, nothing fancy. Raiders don't care about art, which is terrible to say, but it's true. We need raid content." Having built most of the game's caves, I told him I could whip up a cave super-fast as long as it didn't have stalactites or stalagmites. "That's perfect for the Molten Core—we need lava caves."

Without meetings, concepts, or producer's approval, I created the easiest dungeon I'd ever built in only a week—the Molten Core. I was a little embarrassed about how simple the geometry was. I sculpted the bulk of the layout in a couple of days, and spent a few more applying textures. After showing Jeff the result, he was ecstatic, and his only request was to disconnect a short passage between Golemagg and the lava hounds to make the layout non-circular. He also asked me to make sure players could get out of the lava in the boss area in the center of the dungeon.

Over the next few weeks I tweaked details, such as giving the boss room some runes on the walls and adding a bed of hot coals near an encounter area. I embedded interactive runes into the ground in case the game designers scripting the boss battles could use them as part of the fight mechanics. Alas, the runes were unimportant, but the bed of coals was used in a fight against Majordomo Executus. I built a spiral around Ragnaros's spawn location because I couldn't think of a better way for how melee characters could battle a creature that spawned in lava. Aside from the spiral and the hot bed of coals, there was nothing to the Molten Core other than wide-open, empty spaces for combat. The only available props were steam vents and fog volumes (they glowed orange in the Molten Core's warm lights), and Gary Planter helped me apply a scrolling texture to simulate dripping lava. I only needed a few textures from Brian Morrisroe's Blackrock set. Because the Molten Core was such a simple file (it was one-fourth the size of our smallest dungeon), we included it in one of our data patches.

Despite the lack of thought and time I'd put into the Molten Core, it was the only source of compliments I'd ever received from fans. Never minding the art and architecture that went into our dungeons, our players loved the fog

effects. Whenever fans asked what I'd built for WoW, the only reaction I ever got was for the Molten Core's stupid red fog: "I love the hot feel of the place! All the red smoke is so cool!"

With exactly one month until the manufacturer had our game on the shelves, the designers began testing the Molten Core's boss fights internally with forty or so developers from both Teams 1 and 2. The laughable Alterac Valley tests looked *coordinated* compared to the early raid tests, despite all the debriefing and instructions given. While the designers described each fight in chat (which was ignored), people got bored and made choo-choo sounds, prompting others (who found it annoying) to tell them to stop—which only encouraged more choo-choos. Players barely buffed one another, and all communication was done in chat; there was neither voice software nor any raid interface whatsoever: Players could see health bars only of immediate party members.

Jeff used the DPS meters (damage-per-second trackers, beta add-ons built by fans because we didn't have internal tools for the job) to measure the combat numbers. Our volunteer group couldn't pass the trash mobs (mobs were mobile monsters, and trash indicated that the rewards for killing them were disposable; hence, trash mobs were "filler" monsters before the boss encounters) without wiping out, so we didn't even try a boss fight. Even though we wiped (when all forty members died) to every "pull" of combat, Jeff got useful data and took screenshots of the DPS output and combat logs before he moved us on to the next trash mob. Many of us were incredulous that players would be able to kill these monsters. In chat he typed out: "Trust me. Organized raids will be able to get past this content easily." Between fights, Jeff typed out brief descriptions of the combat mechanics to the unruly group, although there was scant evidence anyone was reading his instructions.

In subsequent raid tests, we confronted our first boss, the lava hounds (we sometimes could kill trash mobs in the tests that followed, but we still lost half of the raid on every pull). Some people forgot to repair their gear after dying so often. After Jeff explained that all the lava hounds needed to be killed within seconds of one another, many of us cheered and typed our approval. We were thrilled to learn WoW was going to have content this difficult. It felt as though we weren't working on a Blizzard game anymore. Jeff continued to reassure the other developers: "Trust me, once the raiders figure this out, it will be trivial."

The developer tests provided useful data, but we were so woefully disorganized that the volunteer raiding party was replaced with an in-house task force of the forty best QA players. The ad hoc QA raid group worked together, played in the same room, was much closer to true raid-group performance, and provided better feedback. But even that group couldn't discover all the bugs that public testing could find, so the designers eventually relented and set up a test server. It was decided that having spoilers on a test server was far better than broken boss fights, so the Molten Core was the dev

team's first and last taste of in-house raid testing.

Thunderfury, Blessed Blade of the Windseeker—weapon design by Carlo Arellano, lore by Alex Afrasiabi, September 2004. Carlo was one of several concept artists on the team who learned to apply their skills to 3D art asset creation. After he received a task to retexture a cutlass, he read Alex's story. It was so epic, Carlo redesigned the weapon from scratch and taught himself particle effects to "turn it up to eleven." Image provided courtesy of Blizzard Entertainment, Inc.

The end of closed beta, 11:30 p.m. on October 31, 2004. Korean players responded to the thirty-minute warning of the server going down. Without planning, all the players went back to their capital cities. Orc players gathered around Thrall, as did the undead Sylvanas in the Undercity. The tauren went to their starting village and sat around a bonfire, danced, laughed, and set off fireworks until the world's end. Image provided courtesy of Blizzard Entertainment, Inc.

November 2004: Open Beta

We were winding down three weeks before the game shipped, and the designers and programmers joined the artists in working normal hours. After launch, the entire team would take a couple of weeks off before returning in December. Many people stayed out until January. The first code patch was already in the can and ready to fix anything that was not working. The art content for the second patch was in good shape, too. We had our PvP battlegrounds and raid dungeons ready for a December dissemination.

Our open beta test ran concurrently with both *EverQuest II*'s and *Half-Life 2*'s launch date. This was something no one was happy about, but these projects were too massive to change course, so while the other games held fast to their schedules, WoW's launch was pushed back until the 23rd to avoid too much collision with the other companies, and most of the development team thought it was a good decision. At the Irvine location alone, the company was hiring GMs at a rate of twenty per week, all crammed into the same giant room. Each shift shared desks with the other shifts in a space that accommodated over a hundred, so it greatly increased the building population (and parking lot congestion). Talk of photo-identification badges and security at every door had everyone shaking their head in disbelief at what the future would hold in store for the company.

The GM staff in Korea celebrated the open beta after a few words of encouragement, November 2004. Everyone was relaxed and ready for the upcoming battle to keep WoW running. In Korea, open betas were 99 percent completed products and ran until the company started charging money (there was no character wipe), and since there weren't box sales from stores, the open beta was effectively the launch day. Image provided courtesy of Blizzard Entertainment, Inc.

Korean customer support (GM) offices, October 2004. The Korean offices were typical cubicles that one would find in any business environment; however, the “napping room” (inset) shows how atypical the job could be. Images provided courtesy of Blizzard Entertainment, Inc.

For the open beta test, we prepared to ramp up our player base by a factor of ten. Downloading demands were the only thing that brought down our servers as the gates opened on November 8. With thirty-nine available realms ready, 400,000 players registered for the open beta in the first twenty-four hours. Fans were enthusiastic enough to pay FilePlanet’s fee and endure a two-day download in order to play WoW for just a couple of weeks. Given

the niche appeal of MMO launches and still tepid preorder sales, we were surprised and unprepared for the heavy interest expressed in beta registrations.

With the open beta came the freshly created raid content, and to the delight of the developers, the first player attempts to rush the raid monsters ended in utter disaster. Industry speculation about WoW's endgame being easy was quickly laid to rest. The first trash mob wiped raid groups again and again. The designers got permission to access a GM account so they could use the "god tool" to clandestinely watch the raid in real time. While we couldn't read their chat logs, we studied how they played—cheering and laughing whenever they wiped (schadenfreude, anyone?). The first players to try our raids weren't wearing good armor, they didn't prepare buffs or flasks, and they soon found themselves jostled about like rookies playing far above their ability level. Many fans were under the impression the raid content was buggy, or speculated that the player level cap was going to be increased, or hypothesized post-launch raid groups would allow for more players. The befuddlement among the players amused the same developers who couldn't figure out the raids, either. Some of us even went to Jeff to ask him if the raids were supposed to be that difficult. It looked as though these raids would appeal to only 1 percent of the player base, so many devs questioned the merit of devoting time and resources in creating them. This *was* a Blizzard game, after all. Instead of reacting to the fans' alarm, Jeff stuck to his guns and relied on his math. "Trust me, they'll get it," was the only reassurance Jeff could offer; however, other experienced raiders concurred—this was *exactly* how hard this content needed to be.

Launch Day

"Vision is what some people claim to have when they've guessed correctly."

— Written on the game designers' whiteboard

Preorders are usually a strong indicator of how a game will sell, which is why so many companies offer incentives to purchase games beforehand. Preorders give publishers and studios an indication of how to plan and budget operations for the future. WoW's preorders were comparatively weak, so the maximum number of sales we ever projected was 400,000 copies in North America. Our first day, sales hit 240,000 copies—far more than the preorders indicated. But selling out was only the first of three surprise factors that led to our servers crashing for weeks.

The second was our concurrency rates, which were four to six times the highest concurrency any MMO had ever had. This was compounded by the fact we released on Thanksgiving weekend, when people had nothing to do but play computer games and check gaming news sites. Instead of enjoying the holiday with four days of soaking up glowing reviews, we were shaking our heads in disbelief about our unstable servers. We activated our "Times Two Plan" the first week, doubling our capacity with emergency backup machines, but it seemed to have no effect. Programmers, IT staff members, and producers worked long shifts to support the overloaded machines and fixed a bug that had unhelpfully pointed new users toward our busiest realms instead of the emptiest.

Unlike other MMOs, *World of Warcraft* had no ramp-up in its audience; we debuted with the world's highest user-base and most concurrent users. The result was that many servers were taken down for maintenance, causing long waits in the server queues. It wasn't even a remotely smooth launch, but most of these issues were resolved within the first few weeks. The 120 people on the GM staff were swamped, and we couldn't hire fast enough to support the demand. It became immediately obvious the GM ranks would outgrow their room in the Blizzard building, so management set them up in satellite facilities. This was a shame because it was nice having everyone under the same roof.

The third and biggest factor that crippled our server performance was our state-of-the-art machines. The servers were so new there were very few people able to detect what was wrong with them…and there *was* something wrong with them. Blizzard's technicians worked around the clock for days, slept on the office couches, and pulled forty-eight-hour shifts in an effort to put out all the fires. The only conclusion they reached was it wasn't our fault. Joe Rumsey, our server programmer, was in the same boat—he couldn't find anything wrong with his code. It took days just to locate a qualified technician from the hardware manufacturer who could pinpoint the configuration mistake they had made in their machines. Once that configuration was corrected, the servers shouldered the overpopulation until Blizzard could purchase and install additional equipment.

Promotional signing by the WoW development team, November 22, 2004. Fans lined up to purchase the first copies of *World of Warcraft* at a nearby store called Fry's Electronics ten hours prior to our launch. Fry's was the only place big enough to host the event, although anyone foolish enough to drive through the area would disagree. Parking was nonexistent in a half-mile radius for the next twelve hours. The signing lasted until 5:00 a.m., and by then, the first question the developers (who'd arrived after lunch the previous day) asked was, "Do you have *any* food?" Image provided courtesy of Blizzard Entertainment, Inc.

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On November 23rd at midnight, Team 2 employees attended a signing at a

local electronics superstore, where they expected (based on a similar event for the launch of *Warcraft III*), at most, two thousand people to show up. It turned into a mob scene with six to seven thousand fans, and there weren't close to enough copies for everyone. The company even broke open the boxes reserved for employees to accommodate the customers. It was both exciting and weird because people were treating us like rock stars…Some of the fans were actually nervous to meet us. For most of us, *World of Warcraft* was our first Blizzard game and we'd never experienced this level of appreciation.

I didn't attend the signing myself. The idea of being blocked in by traffic and starved for eighteen hours didn't appeal to me, so I just went home and relaxed. As with the 10th anniversary party, I was one of the few who stayed home. I woke up and guessed correctly that the servers would be down, so the only way to play WoW was to head into work. The only place in North America that had access to WoW was the Blizzard building (something I'd learned during stress tests), so I drove to work and put into motion my cunning little plan. While the rest of the development team slept in from the hectic signing at Fry's Electronics, I wanted to be the *first person* in the world to make a WoW character.

When I entered the Team 2 area I learned I had been outfoxed by Mark Kern and Joe Rumsey, who were already monitoring the server performance. Both of them had created characters hours before me. *Rats!* Mark, Joe, and I were the only three people who showed up at the office that morning. It was eerily quiet, as the rest of the team had begun their Thanksgiving vacation (that lasted, on-and-off, through January) for a much-needed break from game development. Mark and Joe were dismayed by the connectivity problems and didn't yet know about the hardware issues, and so could only wait (like everyone else) for the manufacturer to reconfigure and fix the servers.

After chatting with Mark and Joe, I sat down and created the world's third account for *World of Warcraft*. I created and customized a character, clicked on the launch button, and was greeted with the first message from a newly born universe:

Aftermath, December 2004. Soaking themselves with champagne on the front lawn of our building (and regretting it after it dried and became sticky), the Team 2 members acquired some closure to this ongoing project. People got drunk, took pictures, passed out, and left work early. A couple of people even vomited in the bathroom. A month later, the company treated everyone to a few days in Las Vegas for a wrap party, but our launch ceremony was still good fun. Photo by Carlos Guerrero. Images provided courtesy of Blizzard Entertainment, Inc.

December 2017: Fourteen Years Gone

That is how we made *World of Warcraft*. But how do I end a book about making a game that is still in development? The nature of the subject matter dooms my narrative to an incomplete conclusion, a story without closure. At least for Team 2 and all the departments at Blizzard that support *World of Warcraft*, such an inadequate ending is a good thing because it means WoW still endures. The game remains fertile ground where people connect and play in as many ways as there are game ideas springing from the imagination of its developers and the passion of its fans. The team went to great lengths to solicit ideas from everyone who wanted to contribute. If dead-end ideas were rejected, the designers explained why they wouldn't sustain long-term gameplay: When Eric Dodds analyzed my ideas (which often only appealed to PvP fans), he would caution me to think in broader terms, saying, "MMOs are everything to everybody." MMOs needed elastic features that gave the most bang for the buck, features that would not only be attractive to the greatest number of players, but also provide jumping-off points for future designers.

WoW was never a game with innovative technology or unique features. It was a game with enough meaningful and elegant systems that were flexible enough to provide abundant content, giving players the opportunity to choose how to play. WoW was not just a combat or exploration game. It was not just a treasure hunt for ingredients or a footrace to the best loot. It wasn't just a solo, social, or community game. It was an interconnected gestalt of these things, so that there were too many ways to play. And while the cautionary phrase "MMOs are everything to everybody" describes WoW's features, I think it also explains WoW's longevity. Retaining an audience is easier when they are allowed to play whichever way they please.

When WoW was still in development, I brashly predicted a twenty- year life expectancy for the game, and while many doubted my optimism it's now looking as if my estimates were conservative. Someday in the future, after all the server populations are condensed into a few remaining realms, WoW will likely be put into maintenance mode, a state equivalent to life support, like a dying star collapsed in on itself, alive but forgotten, and too dim to be visible in the night sky.

Today, WoW burns brightly as the new blood on Team 2 revisits the game mechanics, improves the technology, polishes the art, and expands the storyline. They are redefining the game's frontier. For now, the game is theirs. The original spirit Allen Adham instilled in the company's approach that "nothing is written in stone" still holds true, and perhaps it is that foundation that enables Team 2 to continue keeping *World of Warcraft* fresh after so many years.

Epilogue

I stayed on Team 2 for a decade, building dungeons, raids, and other architecture. After a few expansions I did something I'd vowed I'd never do again: work on another MMO. Ignoring my reservations, I jumped ship and joined another Blizzard dev team (see page 2). It wasn't a happy fit. From the outset, I argued that the project wasn't ready for level designers, and I proved to be too ornery to deal with, so the company gave me the heave-ho after a year of mutual frustration. Being fired was a relief for me. Before parting ways, I shook hands, and wished everyone in my exit interview good luck.

A few years later I developed an undiagnosed pain in my hands. Using input devices for any length of time creates discomfort, enough to ruin my concentration. Even tablets hurt my fingertips. The condition ultimately severed my contact with computer games, so I mothballed myself out of a start-up company I'd partnered into and left the industry. I haven't worked on or played computer games since.

The closest contact I have to electronic gaming is my participation in a podcast called *Roll for Combat*. At rollforcombat.com, my friends and I record ourselves geeking out, arguing, dropping obscure movie references, and playing RPG campaigns over the Internet.

Nowadays I'm developing various projects in my home state of Ohio. After *The WoW Diary* prints, I'll focus on an idea I've been working on for a couple years—translating dungeon boss fights into a cooperative board game. While tabletop dungeon-crawls have been done many times before, the genre is bogged down by rules, ugly dungeons, slow pacing, and tedious bean-counting. If my gameplay ideas prove compelling, I'll launch a crowdfunding campaign for it…but only when it's ready.

Anyone interested in previews of my future projects can join my email list on my company's website, whenitsready.com